United States Air Force
611 Air Support Group
611 Civil Engineer Squadron

Elmendorf AFB, Alaska

FINAL

Indian Mountain LRRS, Alaska

MANAGEMENT ACTION PLAN

JUNE 1995

By:

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LIST OF ABBREVIATIONS AND ACRONYMS

ACL	Alternative Concentration Limit
ADEC	Alaska Department of Environmental Conservation
AFB	Air Force Base
ANSC	Area of No Suspected Contamination
AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirement
AST	Aboveground Storage Tanks
BCP	Base Comprehensive Plan
bgs	below ground surface
BLM	Bureau of Land Management
BTEX	benzene, toluene, ethylbenzene, xylene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Superfund)
CRP	Community Relations Plan
CSM	conceptual site model
DOI	U.S. Department of Interior
DRO	Diesel-Range Organics
ECP	Environmental Compliance Program
ENE	East-Northeast
EPA	U.S. Environmental Protection Agency
FS	Feasibility Study

LIST OF ABBREVIATIONS AND ACRONYMS

ft	feet
FY	Fiscal Year
GPR	ground-penetrating radar
GRO	gasoline-range organics
HRS	hazard ranking system
IRP	Installation Restoration Program
IRPIMS	Installation Restoration Program Information Management System
Kts	Knots
LRRS	Long Range Radar Station
MAP	Management Action Plan
MAR	Minimally Attended Radar
MCL	Maximum Contaminant Level
NCP	National Contingency Plan
NFRAP	No Further Response Action Planned
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
OU	Operable Unit
PA	Preliminary Assessment
PCB	Polychlorinated Biphenyl
POL	Petroleum, Oils, and Lubricants

LIST OF ABBREVIATIONS AND ACRONYMS

RA	Remedial Action
RAB	Restoration Advisory Board
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act of 1986
SI	Site Investigation
SW	Solid Waste
TSCA	Toxic Substances Control Act
UST	Underground Storage Tank
WACS	White Alice Communications System

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1.0 INTRODUCTION AND SUMMARY

This Management Action Plan (MAP) contains a status summary of the Indian Mountain Long Range Radar Station (LRRS) Environmental Restoration Program and presents the comprehensive strategy for implementing response actions necessary to protect human health and the environment. The MAP also presents general policy for the facility, which, when followed, will promote an organized and consistent approach in the execution of restoration activities. This strategy integrates and coordinates activities under both the Installation Restoration Program (IRP) and the Environmental Compliance Program (ECP).

The IRP at Indian Mountain LRRS includes all Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) activities conducted, and other potential contaminant source areas identified and investigated. The source areas addressed under Indian Mountain's ECP includes non-IRP sources that are regulated through associated environmental compliance programs.

This MAP is a dynamic document that will be updated on a regular basis to incorporate information and reflect IRP and ECP actions, such as the completion or change in status of any remedial actions (RAs). The Indian Mountain MAP does the following:

- Section 1.0

  describes the objectives of the Indian Mountain IRP and ECP and the purpose of this MAP, identifies the project team formed for the program, provides a brief history of the installation, and sets forth policies and procedures for reporting and field investigations;

- Section 2.0

  summarizes the installation comprehensive plan and present, future, and surrounding land use;

- Section 3.0

  summarizes the status of the Indian Mountain IRP and ECP, accounts for all contaminated source areas, and clearly defines the regulatory programs under which each source area is being addressed.

- Section 4.0

  describes the installation-wide strategy for environmental restoration developed through project team discussions; summarizes plans for managing other, non-IRP source areas (petroleum, oils, and lubricants [POL] sites, underground storage tank [UST] sites, solid waste [SW] sites); describes the activities to be performed under the ECP; and summarizes plans for managing responses under other programs that could affect the restoration program;

- Section 5.0

  provides a master schedule of planned and anticipated activities to be performed throughout the duration of the Environmental Restoration Program, including restoration-related compliance activities; and

- Section 6.0

  describes specific technical and/or administrative issues that have either been resolved or require resolution by the Indian Mountain LRRS project team. Each issue to be resolved includes a strategy and approximate schedule for their resolution.

The appendices, which are attached to this MAP, provide supporting documentation for execution of restoration activities in addition to setting forth policy information critical to planning and streamlining the restoration process. Each appendix is referenced as appropriate throughout this plan.

Appendix A includes fiscal year requirements/costs. Appendix B is a listing of Indian Mountain environmental restoration documents. Appendix C provides a summary of decision documents and records of decisions (RODs). Appendix D provides summaries of No Further Response Action Planned (NFRAP) decisions. Appendix E presents current conceptual site models (CSMs).

1.1 ENVIRONMENTAL RESPONSE OBJECTIVES

The objectives of the environmental restoration program at Indian Mountain LRRS are as follows:

- Protect human health and the environment.

- Comply with existing local, state, and federal statutes and regulations.

- Conduct all IRP activities in a manner consistent with Section 120 of CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA), and with Alaska Statutes 46.03, 46.04, 46.08, and 46.09.

- Establish priorities for environmental restoration and restoration-related compliance activities.

- Continue investigation and remediation efforts at all potential source areas identified at Indian Mountain. The Air Force goal is to clean up all sites, or have remedial action in place where total cleanup has not yet been achieved, by the year 2000.

- Initiate selected removal actions to control, eliminate, or reduce risks to manageable levels.

- Identify and map the environmental condition of installation property, including areas of no suspected contamination (ANSCs), concurrent with remedial investigation (RI) efforts; and characterize risks associated with releases of hazardous substances, pollutants, contaminants, or hazardous wastes.

- Complete the RI/FS feasibility study as soon as practicable.

- Complete site assessments and/or corrective actions at each non-IRP source area as soon as practicable, in order of priority, and in a coordinated effort with the CERCLA RI.

- Develop, screen, and select RAs that reduce risks in a manner consistent with statutory requirements; commence RAs as soon as practicable.

- Conduct program reviews and continually streamline the restoration process.

1.2 MANAGEMENT ACTION PLAN PURPOSE

The MAP process began with the program review for work plan and sampling and analysis plan (SAP) preparation. The program review was completed by June of 1994 when the RI/FS Work Plan (Air Force 1994a) and RI/FS SAP (Air Force 1994b) were completed. These plans provided descriptions of each source area identified at Indian Mountain LRRS and a summary of literature reviews and/or field activities conducted at each source area.

The RI/FS Work Plan was the planning document for all CERCLA sources and other potentially contaminated sites under investigation. In some cases, this MAP excerpts information directly from the Work Plan.

CERCLA, and other ongoing environmental compliance programs are implemented by the Air Force at Elmendorf AFB with support and regulatory oversight provided by the Alaska Department of Environmental Conservation (ADEC). The Air Force is the lead agency for work performed at Indian Mountain LRRS.

This MAP presents, in summary fashion, the status of these various environmental restoration and compliance programs and the comprehensive strategy for implementing these activities. In addition, it defines the status of efforts to resolve technical issues so continued progress and implementation of scheduled activities can occur.

1.3 PROJECT TEAM

The Indian Mountain Project Team has been established and is led by the Chief of Environmental Programs and Restoration. Project Team meetings are the primary means of resolving technical issues and reaching consensus on decisions with state regulators. Table 1-1 lists the team members, and specifies their roles and responsibilities. Project team meetings are described in Section 5.3.

Project team meetings are necessary to review and discuss progress of the work being performed. The review will include discussing reports, evaluating the performance of environmental monitoring, reviewing RI/FS and remedial design (RD)/RA progress, discussing schedules for elements of the RI/FS, resolving disputes, and adjusting deadlines or schedules.

The procedures for project team meetings are as follows:

- Identify regularly scheduled times to review and discuss progress of work being performed at each site. These meetings may be held in conjunction with meeting of the Restoration Advisory Board (RAB).

- Provide a draft agenda and a summary of the status of the environmental restoration work at the installation two weeks prior to the scheduled meeting.

- Provide oral approval of minor modifications to work being performed.

- Within 10 days after the project team meeting, the Remedial Project Manager (RPM) issues minutes of the meeting, including the meeting agenda and all documents discussed during the meeting.

TABLE 1-1

Current Indian Mountain Project Team Members

Name	Title	Telephone	Role/Responsibility
PROJECT TEAM MEMBERS			
Patricia Striebich	Remedial Project Manager 611th CES/CEVR	Phone (907) 552-4532 FAX (907) 552-9563	IRP Project Manager
Samer Karmi	Alaska Restoration Team Chief	Phone (210) 536-5297	Contract Management and Oversight
Laura Noland	Alaska Department of Environmental Conservation (ADEC) Specialist	Phone (907) 451-2139 FAX (907) 451-2187	Key Regulatory Contact
Stephen S. Kmiecik	Captain, USAF	Phone (907) 552-4532 Fax (907) 552-1533	Chief Environmental Flight
David Cook	HQ/PACAF/CEVR	Phone (808) 448-6697 FAX (808) 449-0427	HQ Point of Contact for IRP
John P. DeWine	Captain, USAF	Phone (907) 552-4498 FAX (907) 552-1533	Chief, Environmental Compliance
Robert Henry	Project Manager, Jacobs Engineering	Phone (303) 595-8855 FAX (303) 595-8857	Project Manager for Environmental Services
Bret Berglund	Hydrogeologist, Booz Allen (AFCEE)	Phone (907) 552-9765 FAX (907) 552-9763	Technical Oversight
OTHER KEY PARTICIPANTS			
Rodney Hunt	Lt. Colonel	Phone (907) 552-2217 FAX (907) 552-	Base Civil Engineer, Elmendorf AFB
Roger Lucio	Community Relations Coordinator	Phone (907) 552-4532 FAX (907) 552-1533	Public Affairs Representative, Elmendorf AFB
James Conrad	Lt. Colonel	Phone (907) 532-3451 FAX (907) 552-8577	11 AF Judge Advocate

- Continue to discuss the comprehensive strategy for site closure and reach consensus on the technical approach.

- Discuss schedule updates, provide new information as it becomes available, and provide a forum for open exchange of knowledge.

1.4 BRIEF HISTORY OF INSTALLATION

The following sections describe the environmental setting at Indian Mountain LRRS and past operations that may have resulted in contaminant releases. The RI/FS Report (Air Force 1995) provides more detail about the environmental setting, while the Record Search Report (Air Force 1985) includes information concerning past operations.

1.4.1 Environmental Setting

The Indian Mountain LRRS is located 35 miles south of the Arctic Circle and 168 miles northwest of Fairbanks, and is accessible primarily by air (Figure 1-1). The town of Hughes is located 15 miles west of the station. There is no road connecting the station with Hughes. The 4,270-acre installation is divided into two areas: an Upper Camp and a Lower Camp. The two areas are connected by a steep, winding road approximately nine miles long. Indian Mountain LRRS is located in the Indian River uplands, an area that drains into the Koyukuk River. The terrain is characterized by low, rolling mountains and linear ridges separated by narrow valleys vegetated with spruce and birch trees. The Upper Camp occupies the summit of Indian Mountain at an elevation of 4,200 feet (ft). The Lower Camp, at an elevation of 1000 ft, is situated just above and between the confluence of the Indian River and Utopia Creek. The streams bounding the Lower Camp were extensively mined until the 1950s.

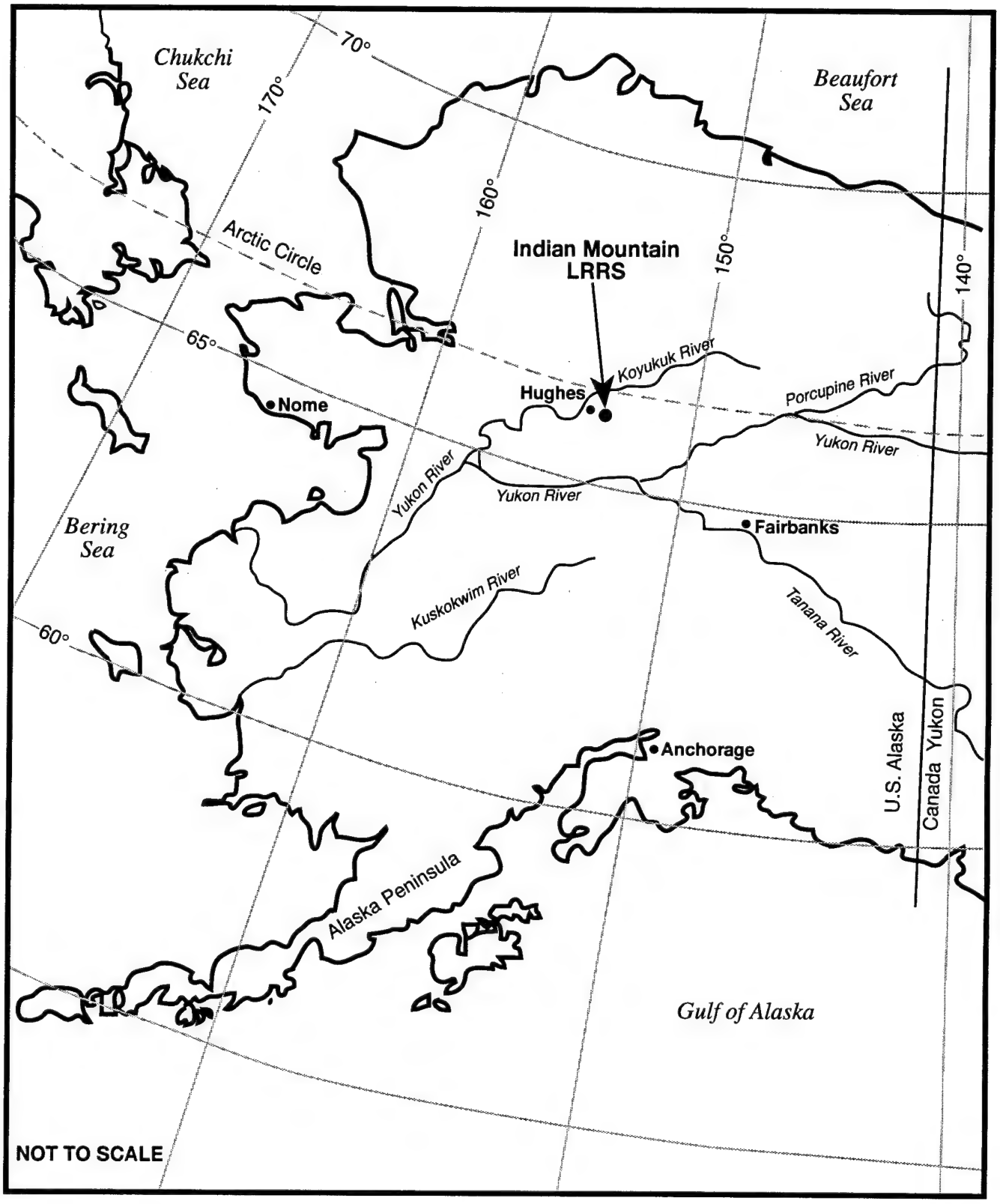


FIGURE 1-1
Location Map
Indian Mountain LRRS

The station occupies an area of deeply sloping foothills with some exposed bedrock and thin sand, gravel, or boulder layers. Quaternary sediments are thickest at lower elevations. Relatively flat, low-land areas have thick surficial layers of organic material. Permafrost is discontinuous depending on elevation, soil type and depth, slope orientation, and other factors.

The geology of the Lower Camp is dominated by recent alluvium deposited by the Indian River and its local tributaries. Bedrock was observed as surface outcrops and detected in soil borings at depths as great as 23 feet below ground surface (bgs). The alluvium consists of stratified accumulations of silt, sand, and gravel. The maximum thickness of the alluvial deposits is unknown.

The Upper Camp geology consists of thin deposits of sand, gravel, cobbles, and boulders overlying fractured bedrock. Outcrops of bedrock do exist along steep slopes and high mountain surfaces, although the ground surface in the vicinity is covered with lichen or boulders.

Virtually all surface water from the installation drains into the Yukon River via the Koyukuk River. Surface water from the Lower Camp area drains into the Indian River, which discharges into the Koyukuk River downstream of the village of Hughes. Surface water from the northern and eastern slopes of Indian Mountain drain into Mentanontli Creek which discharges into the Koyukuk River upstream of Hughes.

The hydrogeology of the Lower Camp is dominated by alluvium deposited by the Indian River and its tributaries. The spring-summer groundwater level in the alluvium is probably determined by the river stage (shallow). Based on boreholes drilled in July 1994, groundwater exists as isolated pockets at source areas removed from the river or creek. The hydrogeology of the Upper Camp is controlled by thin residual sand,

silt, and gravel deposits overlying bedrock at shallow depths (3-8 ft). Some of the north and northeast slopes of Indian Mountain are overlain by glacial materials. Groundwater occurs in these surficial deposits during the spring/summer melt and thaw cycle. The water flow proceeds downslope in the shallow deposits, either following the bedrock contours or the permafrost table toward the valley floor below. Discontinuous permafrost is thought to affect the movement of groundwater at both camps.

The mean annual temperature at Indian Mountain LRRS is 24° F. Summer temperatures range from 38 to 65° F; winter temperatures are -16 to 18° F. The most extreme recorded temperatures are -60 and 85° F. Mean annual precipitation is 19.4 inches with a 24-hour maximum precipitation of 3.3 inches. Annual surface winds at the Lower Camp average 8 knots (kts) from the east-northeast (ENE). Wind is calm 34 percent of the time. The most extreme wind recorded was 76 kts from ENE.

1.4.2 Historical Operations

In 1951, an Aircraft Control and Warning facility was constructed at Indian Mountain to cover radar gaps in interior Alaska. Operations at the installation began in 1953. A high-frequency radio system supplied the initial communications. This system proved unreliable due to atmospheric disturbances and a White Alice Communications System (WACS) was built. The WACS was activated in 1958. This terrestrial system eventually became obsolete and was replaced in 1979 by an Alascom-owned satellite earth terminal. In 1984, a Minimally Attended Radar (MAR) unit was installed and remains active.

Most of the original facilities, including the WACS, were demolished in 1986. The only structures remaining at Upper Camp is the MAR unit and a small shack for a

backup generator. At Lower Camp, existing structures include the industrial-residential composite facility, two storage buildings, a pump house, and several aboveground fuel tanks. Table 1-2 presents a history of installation operations at Indian Mountain LRRS. Figures 1-2 and 1-3 present locations of past hazardous substances activities at the installation. Letter coding on these figures corresponds to the MAP column of Table 1-2.

Operations at Upper Camp that could have resulted in contaminant releases include the following:

- liquid product and waste storage in drums;
- petroleum fuel storage and distribution;
- vehicle maintenance;
- road oiling;
- radar equipment operation and maintenance;
- handling transformer fluid or soils containing polychlorinated byphenyls (PCBs);
- burying household waste and vehicle maintenance waste in dump areas; and
- burying Upper Camp structures.

Based on a review of aerial photographs, at least two separate drum storage areas existed at Upper Camp and probably contained several thousand drums. These areas are also referred to as waste accumulation areas. The Records Search Report (Air Force 1985) states that until 1984, waste fluids were collected and spread on the road and runway as methods for dust suppression and waste disposal. Because of this practice, it is not likely that waste liquids were disposed of in dump areas or landfills.

Fuel was transported to Upper Camp using tanker trucks. The tank contents were pumped from a fuel unloading area on the upper bench of Indian Mountain to one of

TABLE 1-2
History of Installation Operations

Period	Operations	Hazardous Substance Activities	RI/FS Reference (Source Area/AOC)	Map Reference
1953-1984	Road Oiling	Waste fluids were collected and spread on roads and runway for dust suppression and as a disposal method	SD07	A
1950s-1984	Drum Storage	Empty drums and drums containing waste or residue were stored and disposed	LF06 - WAA 4	B
1950s-1986	Drum Storage	Storage area for drummed waste awaiting offsite disposal	SS02 - WAA 1	C
1950s-1984	Waste Storage	Aboveground tank used for storage of waste fluids to be spread on roads and runway	SS09 - WAA 3	D
1950s-1970s	Drum Storage	Storage area for thousands of drums	SS10 - WAA 6	E
1960s-1970s	Drum Storage	Unknown	SS03 - WAA 5	F
1950s-present	Fuel Storage	Aboveground fuel tanks and bladders	SS11	G
1950s-present	Fuel Storage	Aboveground bulk fuel tanks and pumps	SS09	D
1950s-1986	Fuel Storage	Aboveground bulk fuel tanks and pumps	SS10	H
1953-1977	Landfill	Sole landfill for this period, accepted all waste Four separate areas	LF04 - Landfill No. 1	I
1970s	Landfill	Location of 50-100 drums from WAA 4	LF06 - Landfill No. 4	J
1978-1980	Landfill	Location of waste generated at Lower Camp during installation cleanup conducted from 1978 through 1980	LF06 - Landfill No. 3	K
1977-present	Landfill	Primary disposal area at installation, accepts all waste materials except hazardous waste	LF05 - Landfill No. 2	L

TABLE 1-2
History of Installation Operations

Period	Operations	Hazardous Substance Activities	RI/FS Reference (Source Area/AOC)	Map Reference
1950s-1970s	Dumps	Disposal areas for Upper Camp waste, including material from 1978-1980 cleanup and building demolition	SD01	M
1958-1979	Communications	Spills and leaks of oil containing PCBs	OT08	N
1950s-present	Fuel Offloading	Offloading fuel from aircraft to installation POL tanks	AOC 1	O
Unknown	Runway Beacon	Use of transformer oils within building and outside	AOC 2	P
1970s	Hardfill	Contains construction/demolition debris, drums, vehicles, and vehicle batteries	AOC 3	Q
Unknown	Fuel Receiving	Receives fuel from offloading pump before transfer to tank farm	AOC 4	R
Unknown	Drum Disposal	Drums with unknown contents on ground surface and buried	AOC 5 and AOC 6	S
Unknown	Hardfill	Hardfill on the north side of area, ponded water present in central and southern portions of area	AOC 7	T
Unknown	Hazardous Waste Storage	Contained hazardous waste prepared for offsite shipment stored in this building, Building 125	AOC 8	U
Unknown	Sewage Treatment	Abandoned sewage treatment tanks	AOC 9	V
Unknown	Oil/Water Separator	Oil/water separator for fluids generated during vehicle maintenance activities	AOC 10	W

Notes: AOC = Area of Concern
WAA = Waste Accumulation Area

two aboveground 200,000-gallon fuel tanks located on the lower bench. Leaks and spills occurred at the fuel pumping site and at the fuel tanks. Smaller tanks were used for vehicle maintenance and electricity generation, but releases from these tanks were not reported.

Release of PCBs was not documented, although the Records Search Report (Air Force 1985) states that 85 drums of PCB-contaminated oil, and 240 drums of PCB-contaminated soil were removed from the WACS site. The date of removal and disposal methods are unknown.

Most of the wastes generated during facility operation were buried on the northwest slope of Indian Mountain. Some dump areas were also developed below the lower bench on the northeast side of the mountain. Waste generated during facility demolition were buried in place, on the upper and lower benches, and at the previously mentioned dump areas.

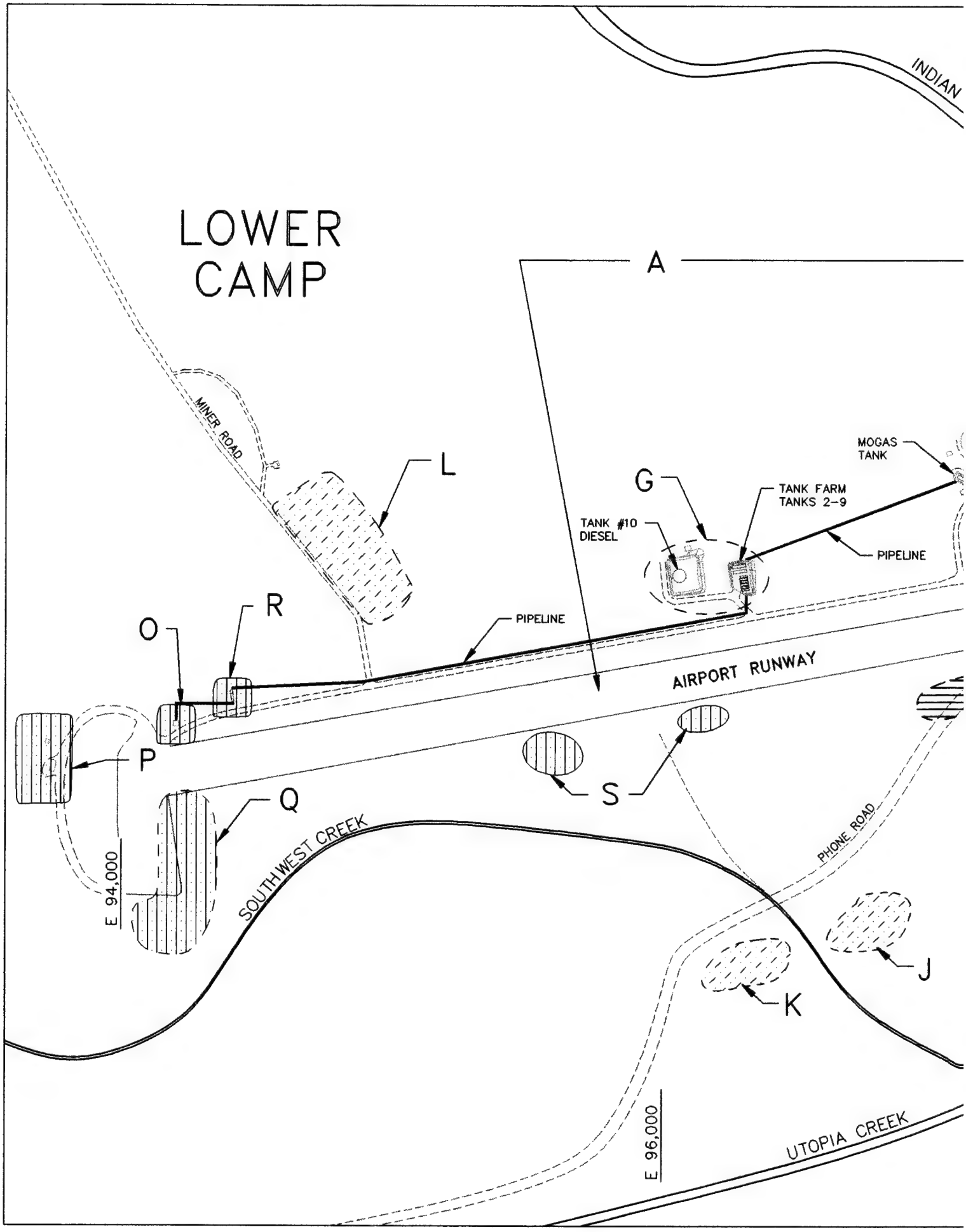
Operations at Lower Camp that could have resulted in contaminant releases include the following:

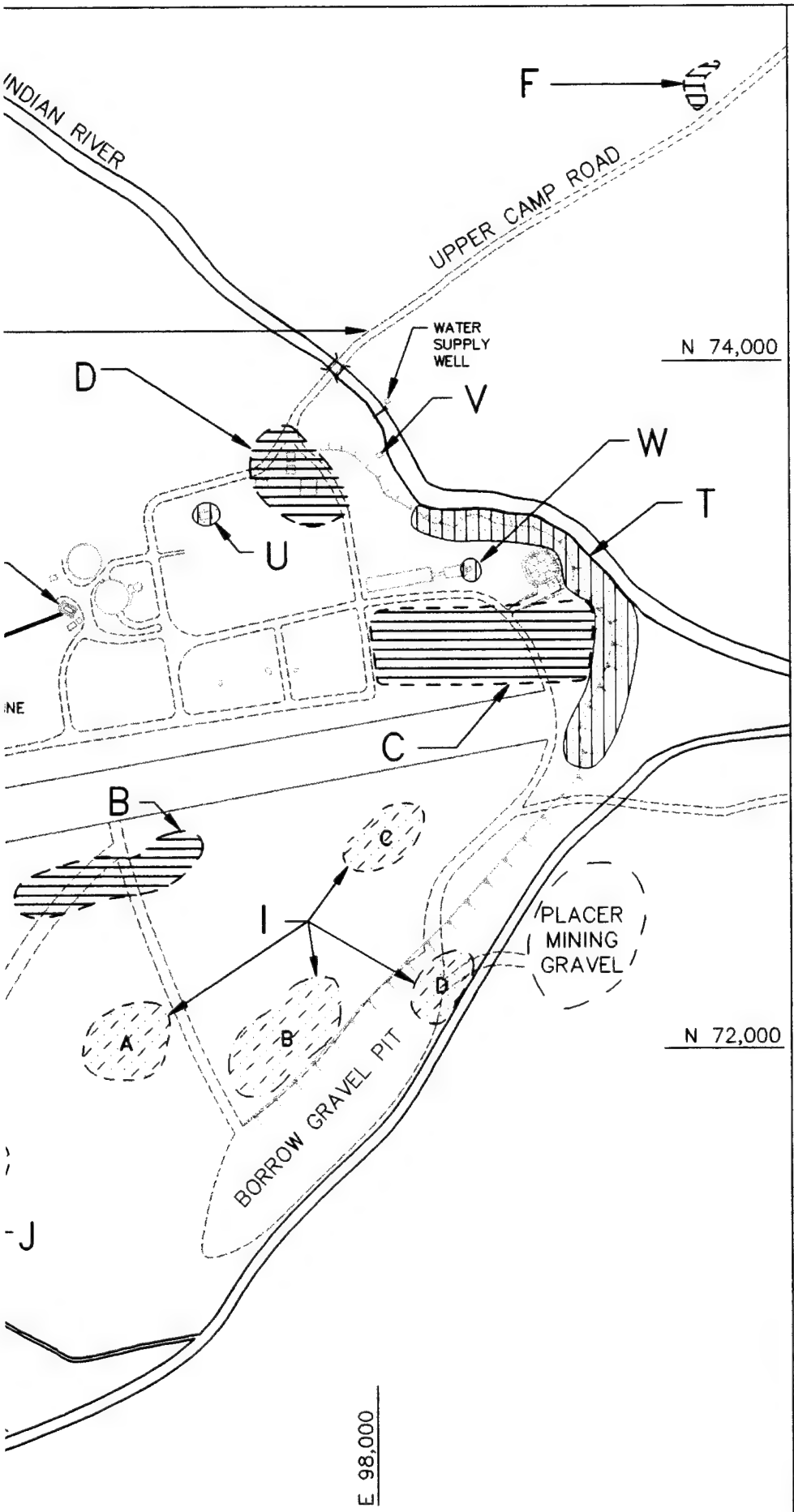
- liquid product and waste storage in drums;
- petroleum fuel storage and distribution;
- vehicle maintenance;
- road oiling;
- power plant operation and maintenance;
- sewage treatment;
- oil/water separation;
- landfilling of wastes; and
- burying Lower Camp structures.

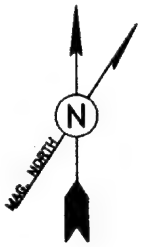
Lower Camp operations were similar to those conducted at Upper Camp. The installation power plant was located at Lower Camp. Diesel fuel was used as feed stock for the plant. All fuel was airlifted to Indian Mountain and pumped into large POL tanks or synthetic bladders. All fuel was stored above ground. A tank located near the power plant was used to contain waste fluids until road and runway application.

1.5 OFF-INSTALLATION PROPERTY

There is currently no off-installation property associated with Air Force tenancy at Indian Mountain LRRS. Alascom holds a lease with the Air Force for operation of a satellite earth station. The Alascom building is shown in Figure 1-3. Alascom has not performed any remediation activities at the installation.


LOWER
CAMP
INDIAN
A
MINER ROAD
L
G
MOGAS
TANK
TANK FARM
TANKS 2-9
TANK #10
DIESEL
PIPELINE
R
O
PIPELINE
AIRPORT RUNWAY
P
S
Q
SOUTHWEST CREEK
PHONE ROAD
E 94,000
J
K
E 96,000
UTOPIA CREEK





MAGNETIC DECLINATION : 24° 42'
ANNUAL RATE OF CHANGE : 4.1'
U.S.G.S. EPOCH 1985

LEGEND

- BUILDINGS
- GRAVEL ROADS
- RIVER, STREAM, OR CREEK
- ESCARPMENT
- CULVERT
- APPROXIMATE WASTE ACCUMULATION AREA LOCATION
- APPROXIMATE LANDFILL LOCATION AREA
- APPROXIMATE AREA OF CONCERN LOCATION

NOTE:
MAP DESCRIPTION IN TABLE 1-2
ALL IRP SOURCE AREA LOCATIONS ARE APPROXIMATE

200 0 200 400

INDIAN MOUNTAIN LONG RANGE RADAR STATIO

LOCATION OF PAST HAZARDOUS SUBSTANCES ACTIVITIES
LOWER CAMP

PROJ. MGR.	ACAD FILE NO.	FIGURE NO.
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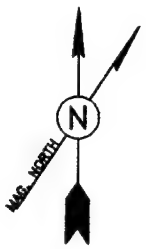

MAGNETIC DECLINATION : 24° 42'
ANNUAL RATE OF CHANGE : 4.1'
U.S.G.S. EPOCH 1985

GEND

BUILDINGS

GRAVEL ROADS

RIVER, STREAM, OR CREEK

ESCARPMENT

CULVERT

APPROXIMATE WASTE ACCUMULATION AREA LOCATION

APPROXIMATE LANDFILL LOCATION AREA

APPROXIMATE AREA OF CONCERN LOCATION

SCRIPTION IN TABLE 1-2

SOURCE AREA LOCATIONS
PROXIMATE

200 0 200 400

INDIAN MOUNTAIN
LONG RANGE RADAR STATION

LOCATION OF PAST HAZARDOUS
SUBSTANCES ACTIVITIES
LOWER CAMP

AD FILE NO.	FIGURE NO.
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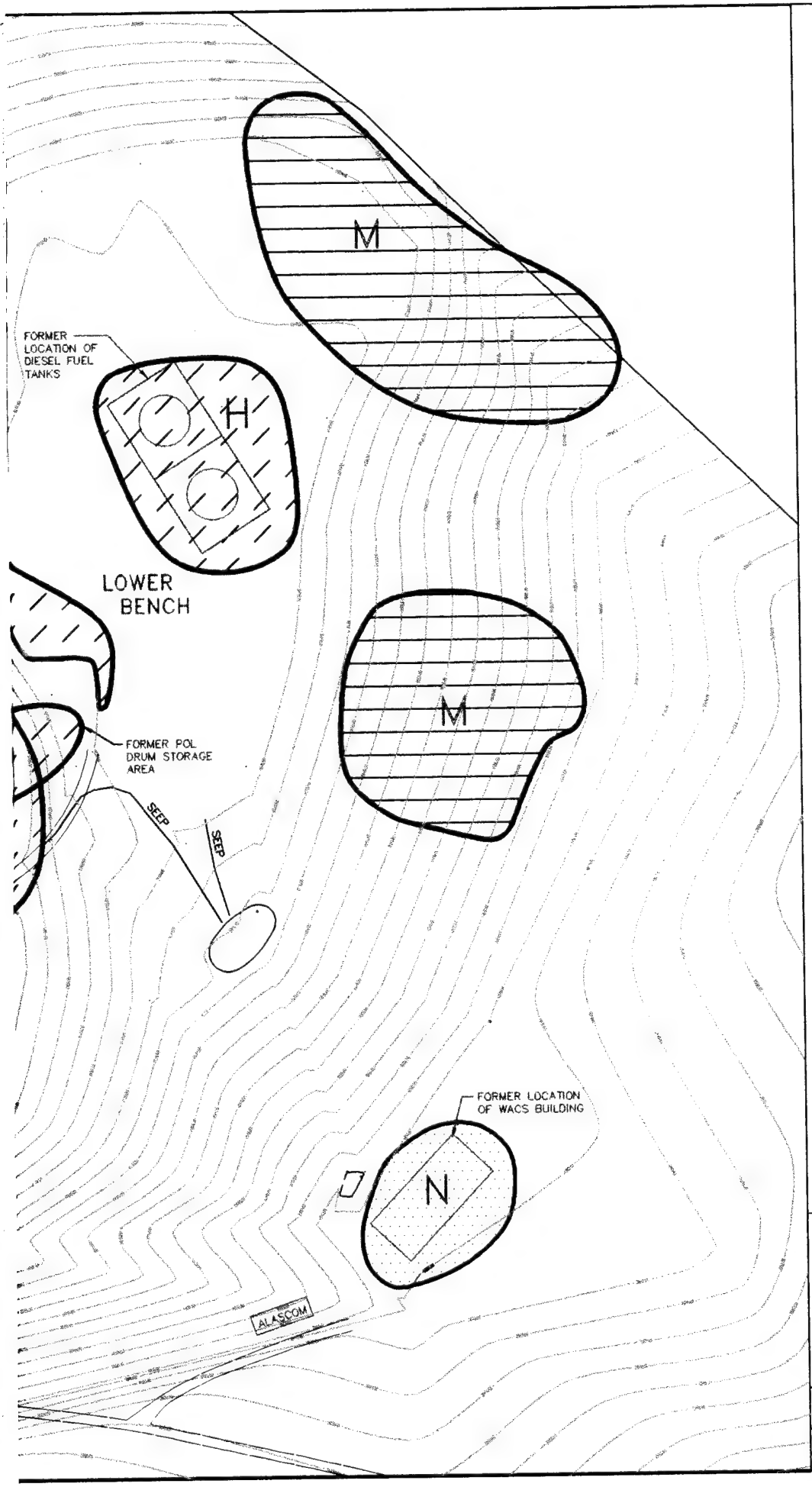
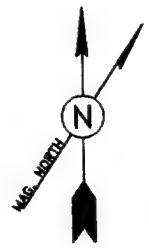
A
FORMER LOCATION OF DIESEL FUEL TANKS
POL TRUCK UNLOADING AREA
FORMER LOCATION OF VEHICLE MAINTENANCE BUILDING
UPPER BENCH
RADOME
4200.00 FEET





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ANNUAL RATE OF CHANGE : 4.1'
U.S.G.S. EPOCH 1985

LEGEND

DUMP AREAS

WASTE ACCUMULATION AND FUEL RELEASES

FORMER WHITE ALICE COMMUNICATIONS SYSTEM

NOTE:

MAP DESCRIPTION IN TABLE 1-2

ALL IRP SOURCE AREA LOCATIONS ARE APPROXIMATE

0 100 200 400

SCALE IN FEET

5 FOOT CONTOUR INTERVALS

INDIAN MOUNTAIN LONG RANGE RADAR ST

LOCATION OF PAST HAZARD SUBSTANCES ACTIVITIES UPPER CAMP

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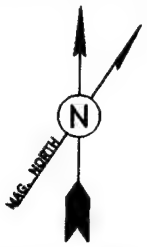

MAGNETIC DECLINATION : 24° 42'
ANNUAL RATE OF CHANGE : 4.1'
U.S.G.S. EPOCH 1985

LEGEND

DUMP AREAS

WASTE ACCUMULATION AND FUEL RELEASES

FORMER WHITE ALICE COMMUNICATIONS SYSTEM

MAP DESCRIPTION IN TABLE 1-2

ALL IRP SOURCE AREA LOCATIONS ARE APPROXIMATE

0 100 200 400

SCALE IN FEET

5 FOOT CONTOUR INTERVALS

INDIAN MOUNTAIN LONG RANGE RADAR STATION

LOCATION OF PAST HAZARDOUS SUBSTANCES ACTIVITIES UPPER CAMP

	ACAD FILE NO.	FIGURE NO.
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2.0 INSTALLATION COMPREHENSIVE PLAN

The Indian Mountain LRRS Comprehensive Plan is intended to direct the long-term development of the installation property by the Air Force. Because the installation is in a remote location that is surrounded by public lands and accessible by air only, the Air Force and their subcontractors are considered to be the only parties utilizing the property. The installation consists of 4,269.82 acres, divided into several tracts that were acquired from the Department of Interior, Bureau of Land Management (BLM) between 1958 and 1976. Of the total, 4,225.99 acres were removed from the public domain, and 43.83 acres may be used by the public by permit (Air Force 1995b). All surrounding areas are owned by the State of Alaska and the Doyon Regional Corporation.

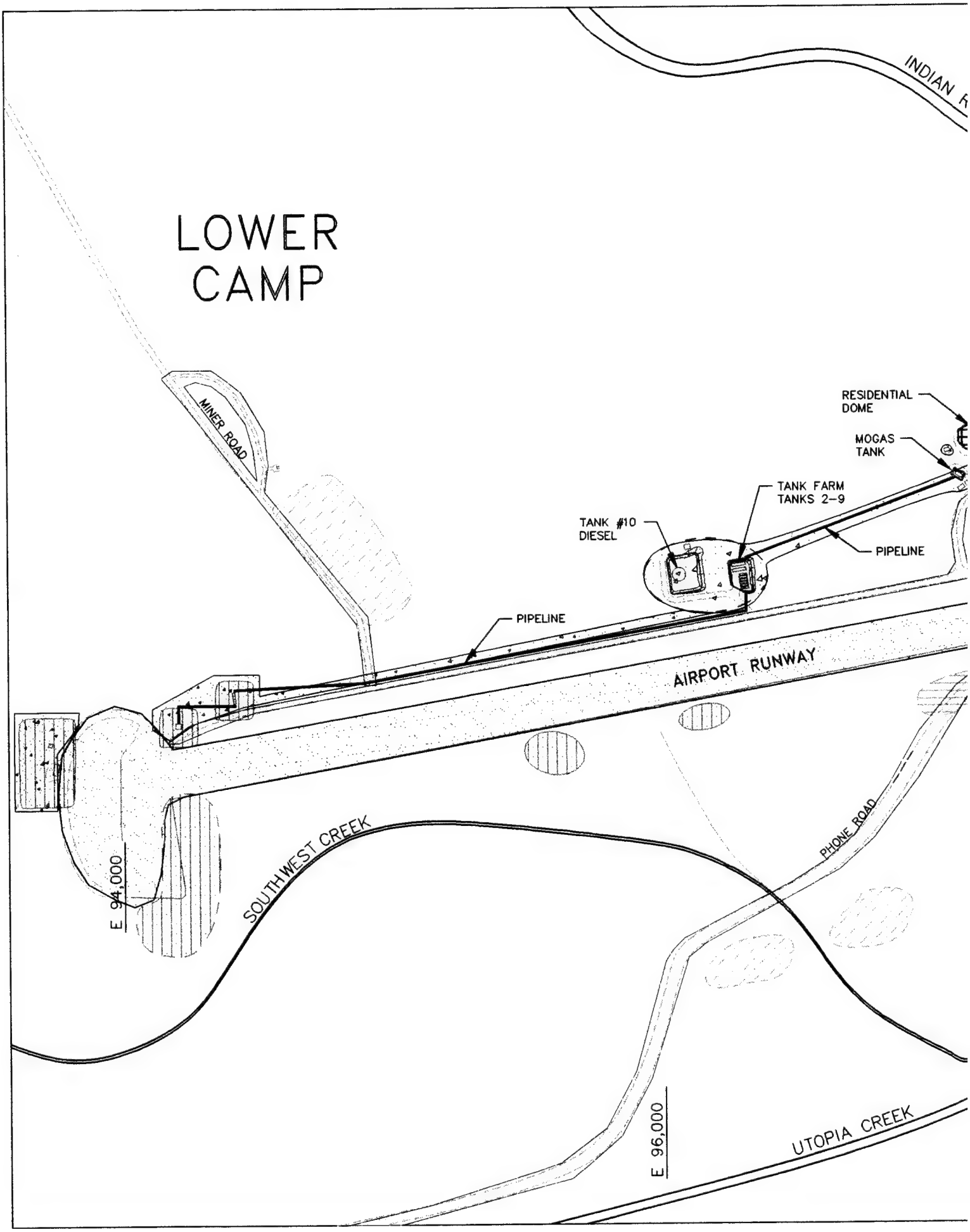
The comprehensive plan categorizes land use types according to function. The land use functions that exist at the installation are as follows:

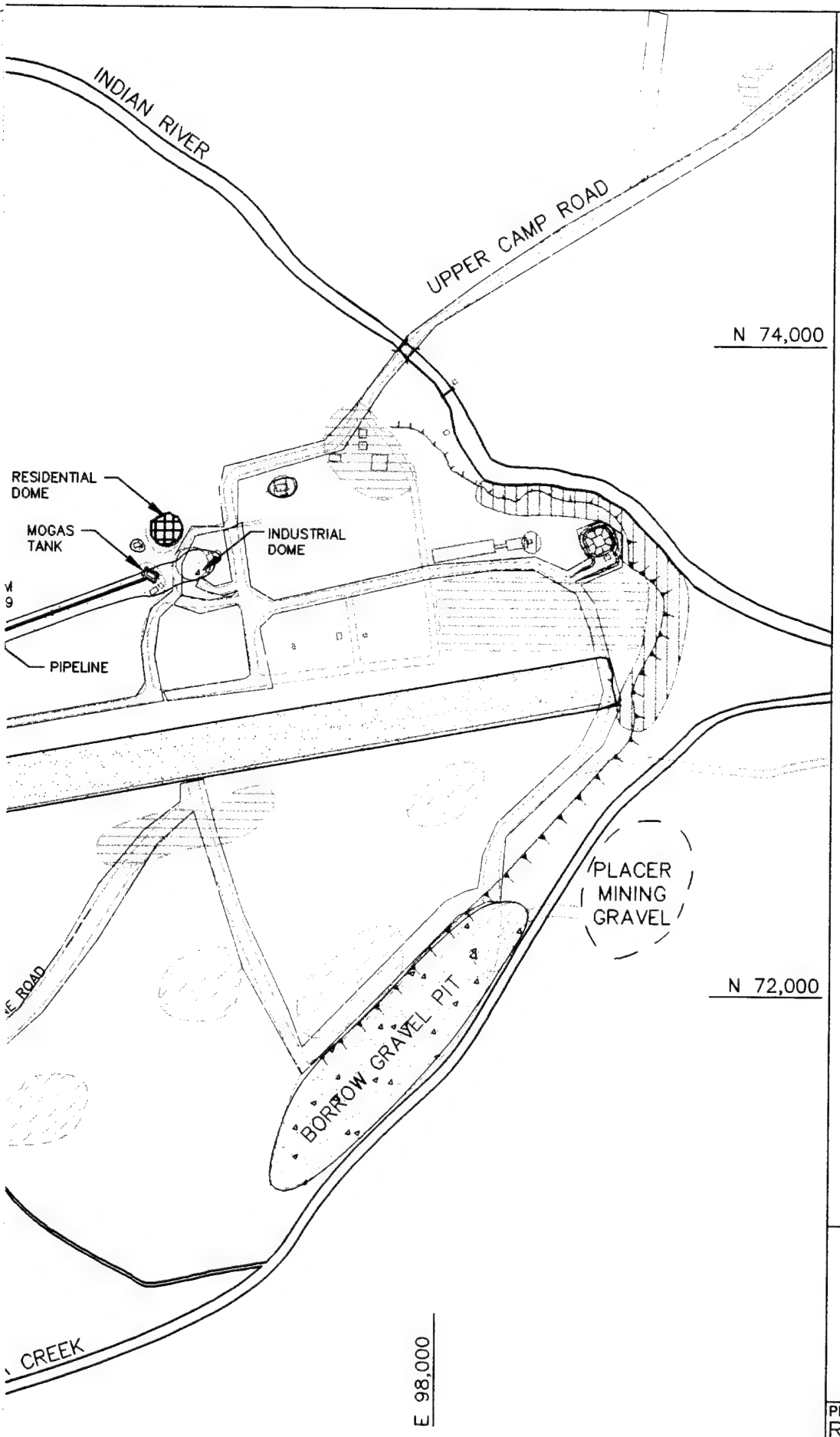
- airfield: active runway, taxiway, and parking apron;
- industrial: areas used for maintenance, storage, and supply functions;
- operations: roadway and utility corridor;
- housing: residential areas; and
- non-Air Force: areas outside the installation boundaries.

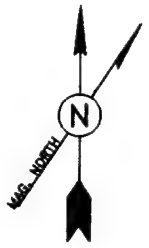
Of particular importance to this MAP and the installation environmental programs are the current and future land use for the station because risk assessments are driven by land-use designations. Figure 2-1 summarizes the present land use at Indian Mountain LRRS Lower Camp. Land use at Upper Camp includes the Air Force radome, roadway, powerline route, and Alascom satellite station. Figure 2-2 shows property ownership in vicinity of the installation. After decisions are made regarding future land use, appropriate

maps will be prepared. Land surrounding the installation is undeveloped other than a few hunting cabins that are not permanently occupied.

The comprehensive plan will be periodically updated to account for evolving national policy and installation operations and land use.


LOWER
CAMP
INDIAN R
MINER ROAD
RESIDENTIAL
DOME
MOGAS
TANK
TANK FARM
TANKS 2-9
TANK #10
DIESEL
PIPELINE
PIPELINE
AIRPORT RUNWAY
SOUTHWEST CREEK
PHONE ROAD
E 94,000
E 96,000
UTOPIA CREEK





MAGNETIC DECLINATION : 24° 42'
ANNUAL RATE OF CHANGE : 4.1'
U.S.G.S. EPOCH 1985

LEGEND

- BUILDINGS
- GRAVEL ROADS
- RIVER, STREAM, OR CREE
- ESCARPMENT
- CULVERT
- APPROXIMATE WASTE ACCUMULATION AREA LOC
- APPROXIMATE LANDFILL LOCATION AREA
- APPROXIMATE AREA OF CONCERN LOCATION
- AIRFIELD
- INDUSTRIAL
- OPERATIONS
- RESIDENTIAL

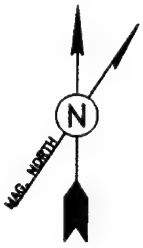
NOTE:
ALL IRP SOURCE AREA LOCATIONS ARE APPROXIMATE

200 0 200 400

INDIAN MOUNTAIN LONG RANGE RADAR S

PRESENT LAND USE
LOWER CAMP

PROJ. MGR.	ACAD FILE NO.	FIGURE NO.
R. HENRY	FIG2-1	2-1
DRAWN BY	PROJ. NO.	DA
HUNTER	05-G-46200	2



MAGNETIC DECLINATION : 24° 42'
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U.S.G.S. EPOCH 1985

LEGEND

BUILDINGS

GRAVEL ROADS

RIVER, STREAM, OR CREEK

ESCARPMENT

CULVERT

APPROXIMATE WASTE ACCUMULATION AREA LOCATION

APPROXIMATE LANDFILL LOCATION AREA

APPROXIMATE AREA OF CONCERN LOCATION

AIRFIELD

INDUSTRIAL

OPERATIONS

RESIDENTIAL

RP SOURCE AREA LOCATIONS
APPROXIMATE

200 0 200 400

INDIAN MOUNTAIN LONG RANGE RADAR STATION

PRESENT LAND USE
LOWER CAMP

ACAD FILE NO.	FIGURE NO.
FIG2-1	2-1
PROJ. NO. 05-G-46200	DATE 2/6/95

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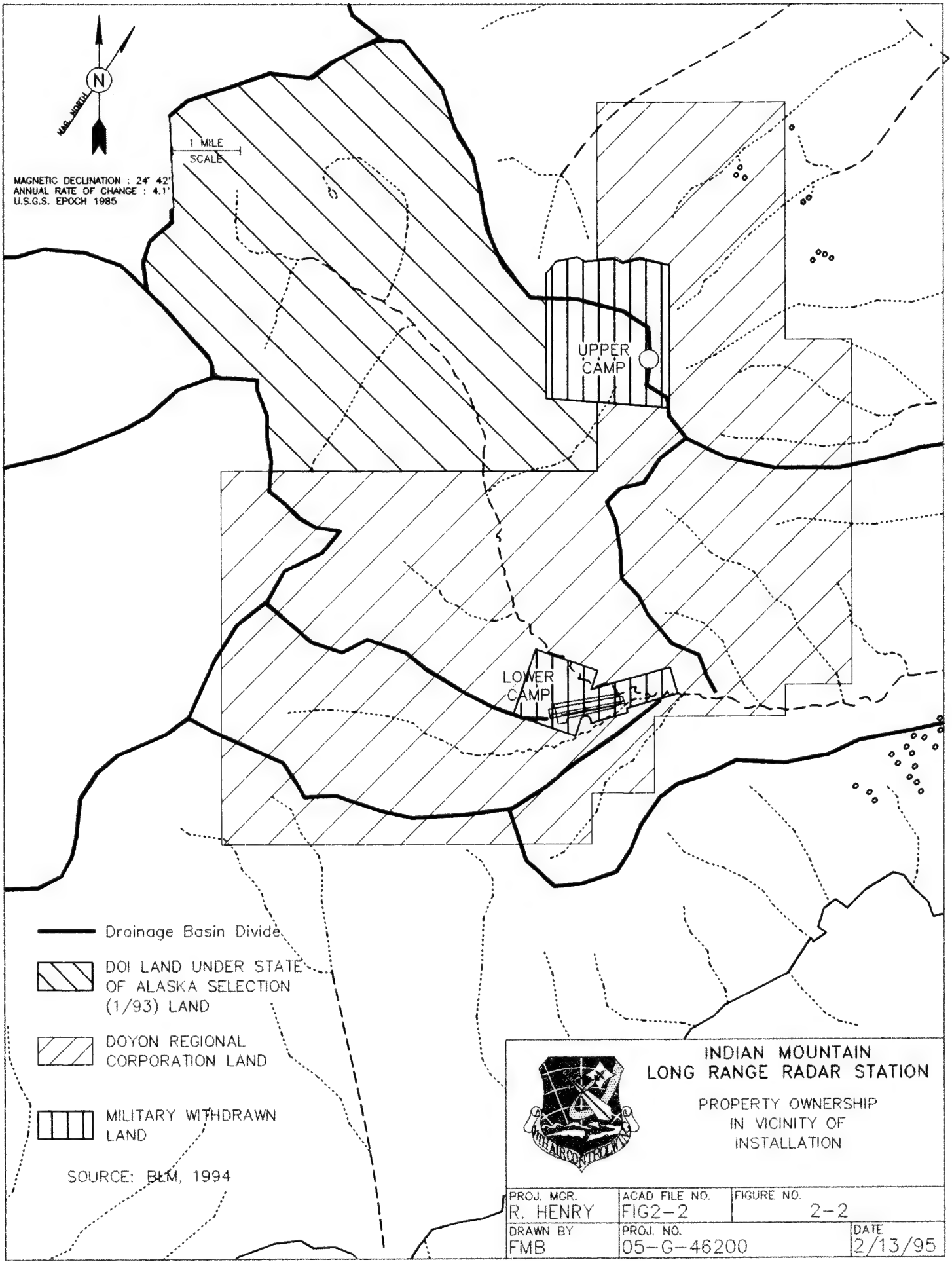
N
MAG. NORTH
1 MILE
SCALE
MAGNETIC DECLINATION : 24° 42'
ANNUAL RATE OF CHANGE : 4.1'
U.S.G.S. EPOCH 1985
UPPER
CAMP
LOWER
CAMP
Drainage Basin Divide
DOI LAND UNDER STATE
OF ALASKA SELECTION
(1/93) LAND
DOYON REGIONAL
CORPORATION LAND
MILITARY WITHDRAWN
LAND
SOURCE: BLM, 1994
INDIAN MOUNTAIN
LONG RANGE RADAR STATION
PROPERTY OWNERSHIP
IN VICINITY OF
INSTALLATION
PROJ. MGR.
R. HENRY
ACAD FILE NO.
FIG2-2
FIGURE NO.
2-2
DRAWN BY
FMB
PROJ. NO.
05-G-46200
DATE
2/13/95

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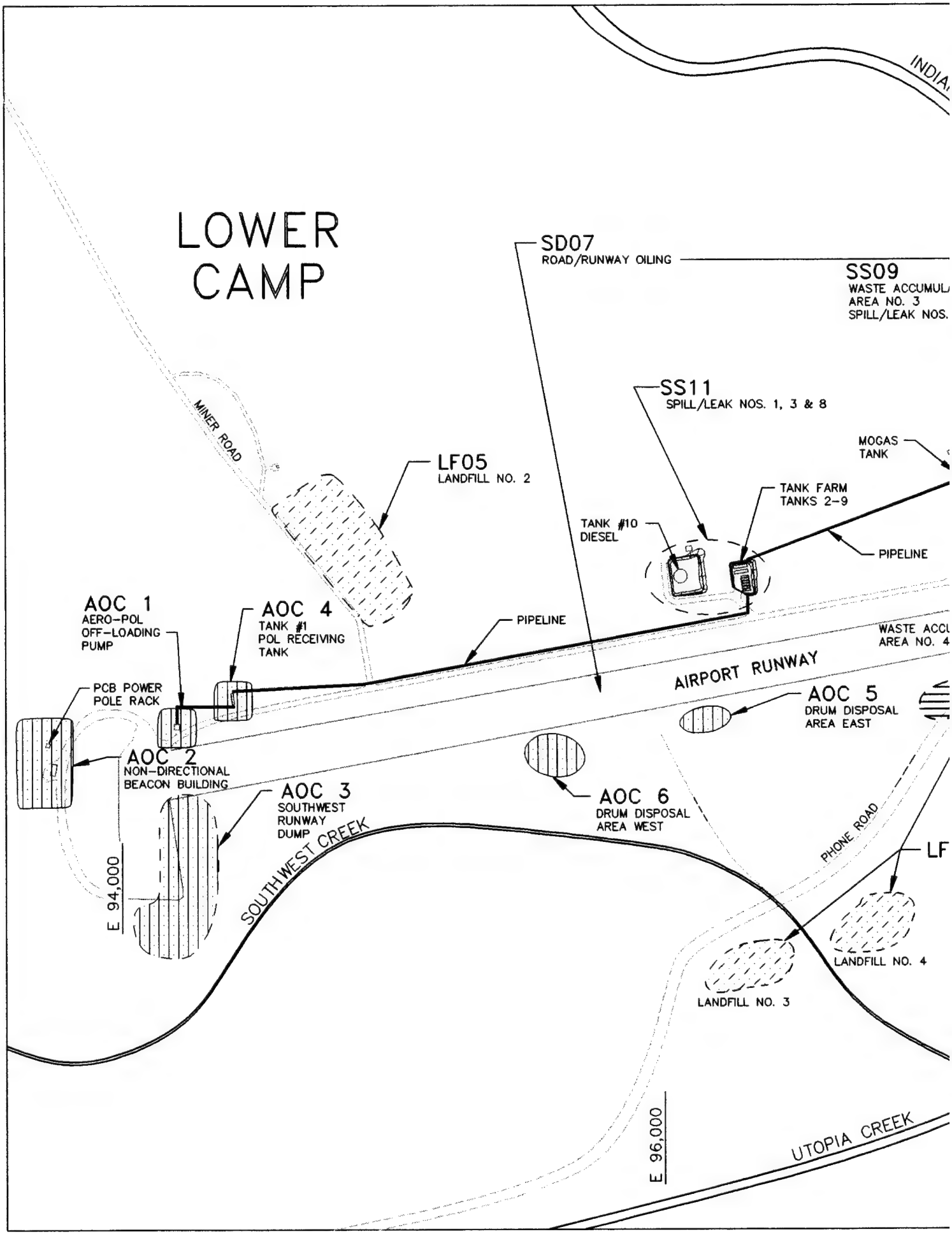
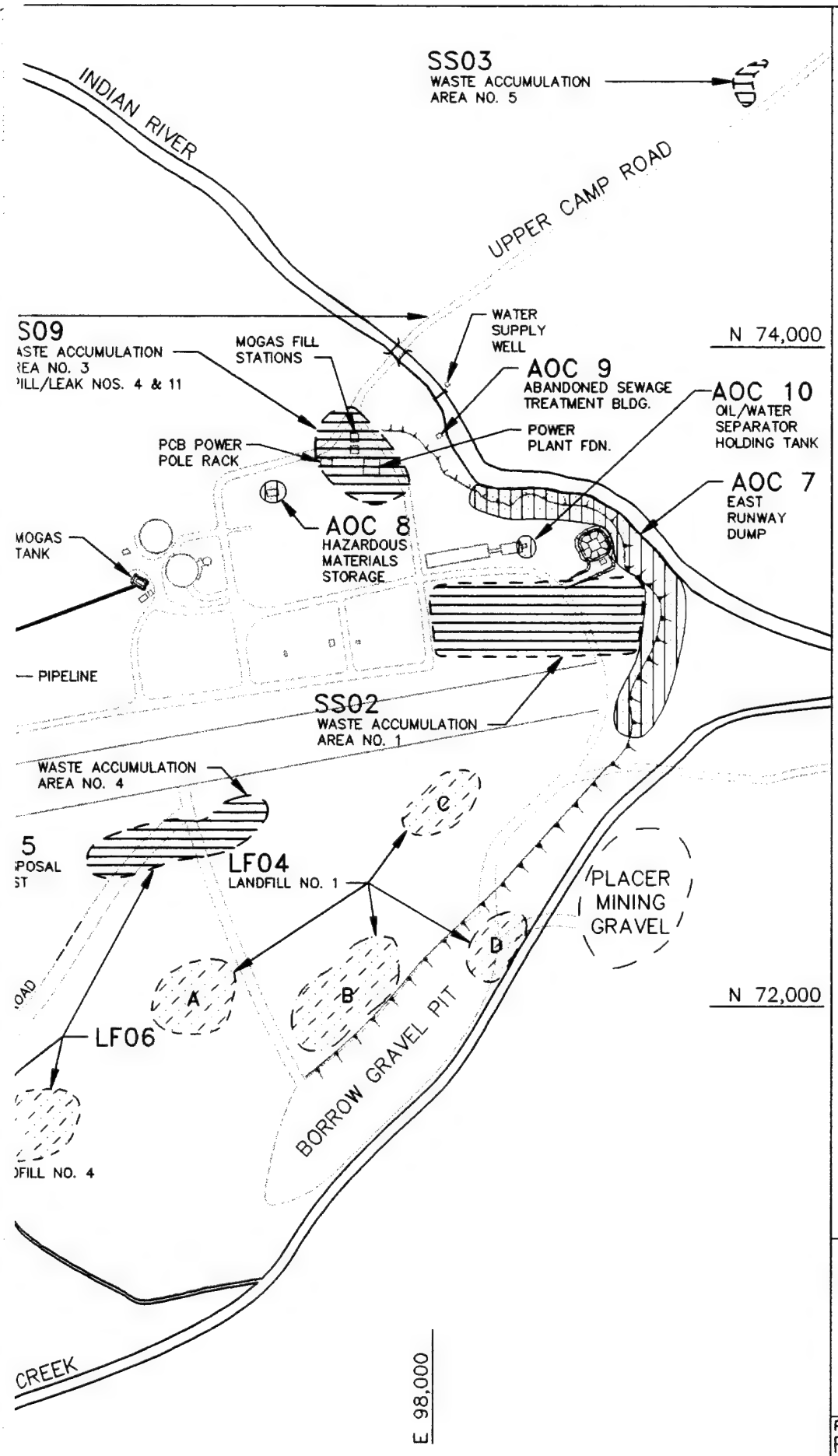
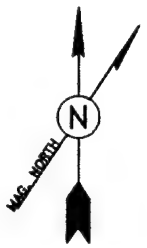

LOWER CAMP
SD07
ROAD/RUNWAY OILING
SS09
WASTE ACCUMUL
AREA NO. 3
SPILL/LEAK NOS.
SS11
SPILL/LEAK NOS. 1, 3 & 8
MOGAS TANK
MINER ROAD
LF05
LANDFILL NO. 2
TANK FARM TANKS 2-9
TANK #10 DIESEL
PIPELINE
AOC 1
AERO-POL OFF-LOADING PUMP
AOC 4
TANK #1 POL RECEIVING TANK
PIPELINE
WASTE ACCU
AREA NO. 4
AIRPORT RUNWAY
PCB POWER POLE RACK
AOC 5
DRUM DISPOSAL AREA EAST
AOC 2
NON-DIRECTIONAL BEACON BUILDING
AOC 3
SOUTHWEST RUNWAY DUMP
AOC 6
DRUM DISPOSAL AREA WEST
PHONE ROAD
LF
SOUTHWEST CREEK
E 94,000
LANDFILL NO. 4
LANDFILL NO. 3
E 96,000
UTOPIA CREEK





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U.S.G.S. EPOCH 1985

LEGEND

- BUILDINGS
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- RIVER, STREAM, OR CREEK
- ESCARPMENT
- CULVERT
- APPROXIMATE WASTE ACCUMULATION AREA LOC
- APPROXIMATE LANDFILL LOCATION AREA
- APPROXIMATE AREA OF CONCERN LOCATION

NOTE:
ALL IRP SOURCE AREA LOCATIONS ARE APPROXIMATE

200 0 200 400

INDIAN MOUNTAIN LONG RANGE RADAR ST

SOURCE AREAS AND AREAS OF CONCERN LOWER CAMP

PROJ. MGR.	ACAD FILE NO.	FIGURE NO.
R. HENRY	FIG3-1	3-1
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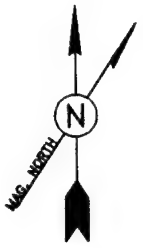
HUNTER	05-G-46200	2/



MAGNETIC DECLINATION : 24° 42'
ANNUAL RATE OF CHANGE : 4.1'
U.S.G.S. EPOCH 1985

LEGEND

- BUILDINGS
- GRAVEL ROADS
- RIVER, STREAM, OR CREEK
- ESCARPMENT
- CULVERT
- APPROXIMATE WASTE ACCUMULATION AREA LOCATION
- APPROXIMATE LANDFILL LOCATION AREA
- APPROXIMATE AREA OF CONCERN LOCATION

ITE:
L IRP SOURCE AREA LOCATIONS
E APPROXIMATE

200 0 200 400

INDIAN MOUNTAIN
LONG RANGE RADAR STATION

SOURCE AREAS AND
AREAS OF CONCERN
LOWER CAMP

	ACAD FILE NO.	FIGURE NO.
NRY	FIG3-1	3-1
	PROJ. NO.	DATE
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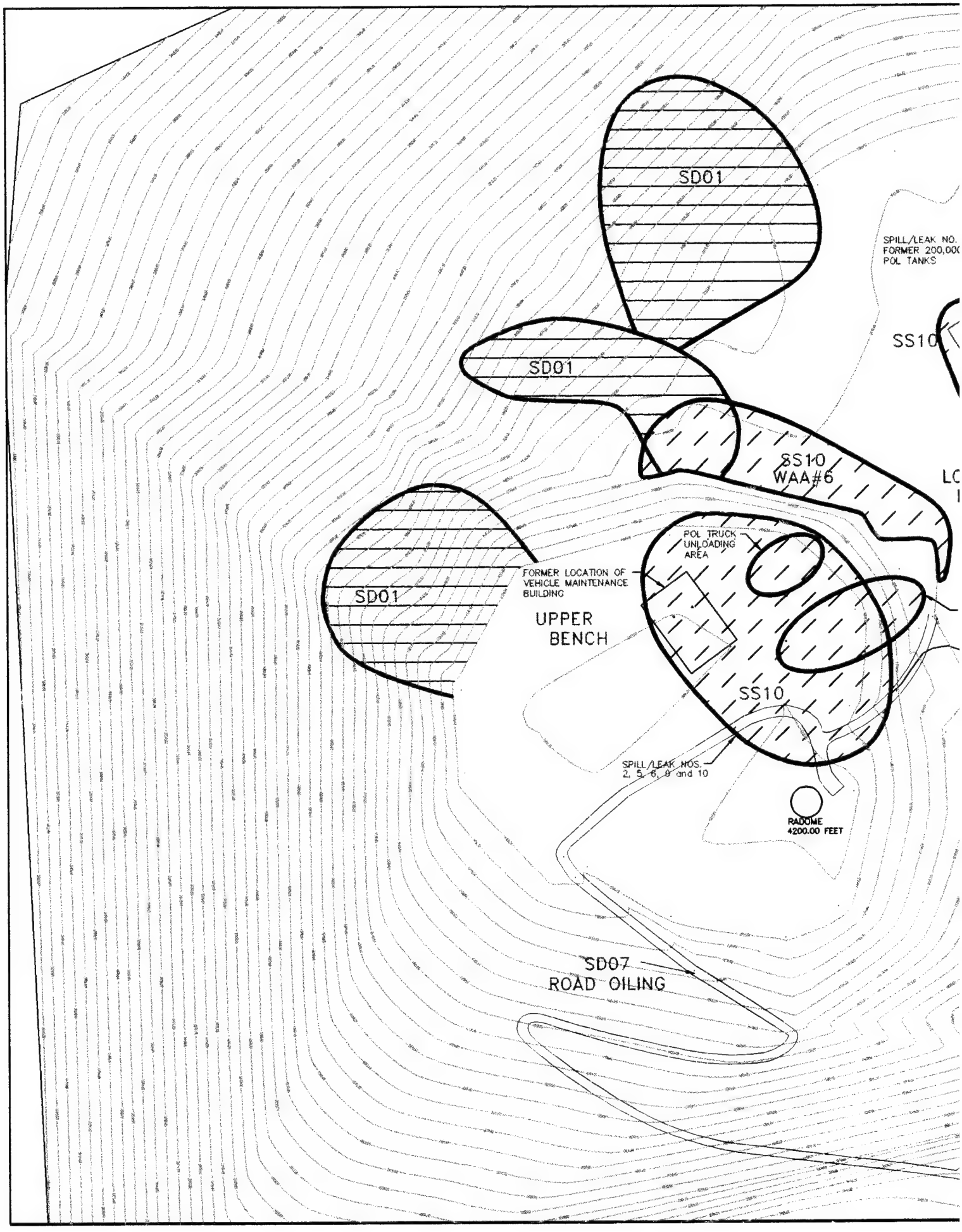
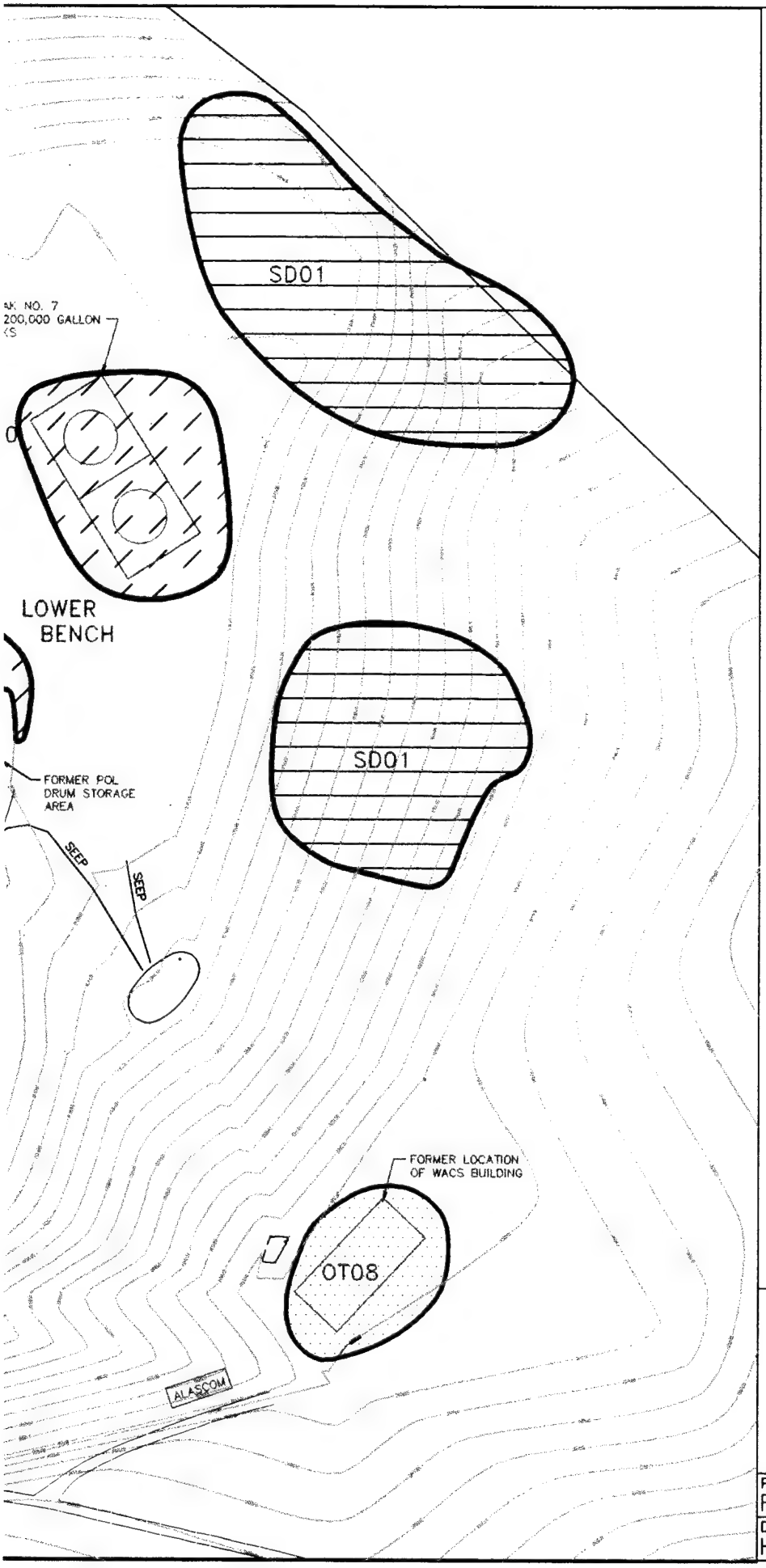
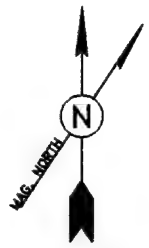

SD01
SD01
SD01
SS10
WAA#6
SS10
SPILL/LEAK NO.
FORMER 200,000
POL TANKS
POL TRUCK
UNLOADING
AREA
FORMER LOCATION OF
VEHICLE MAINTENANCE
BUILDING
UPPER
BENCH
SS10
SPILL/LEAK NOS.
2, 5, 6, 9 and 10
RADOME
4200.00 FEET
SD07
ROAD OILING





MAGNETIC DECLINATION : 24° 42'
ANNUAL RATE OF CHANGE : 4.1'
U.S.G.S. EPOCH 1985

LEGEND

SD01 – DUMP AREAS

SS10 – WASTE ACCUMULATION AREA 6 AND FUEL RELEASES 2, 5, 6, 7, 9, AND 10

OT08 – FORMER WHITE ALICE COMMUNICATIONS SYSTEM

NOTE: ALL IRP SOURCE AREA LOCATIONS ARE APPROXIMATE

0 100 200 400

SCALE IN FEET

5 FOOT CONTOUR INTERVALS

INDIAN MOUNTAIN LONG RANGE RADAR STATION

SOURCE AREAS
UPPER CAMP

PROJ. MGR.	ACAD FILE NO.	FIGURE NO.	
R.HENRY	FIG3-2	3-2	
DRAWN BY	PROJ. NO.		DATE
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TAB
Indian Mou
Installation Restoration Program Sou

Source Area/ AOC	Former Site ID	Description	Material Disposed of/ Dates of Operation	Commer
SD01	Source 9: Dump Areas	• Dump areas on eastern, northern, and western slopes of Indian Mountain at Upper Camp	• Rubbish, wood, metals, drums, and plastic from the 1950s to the 1970s • Demolished structures from 1978 to 1980	• Some drums p filled with oil, la drained and cr • Dump areas ar downgradient c fuel releases a Accumulation A
SS02	Source 5: Waste Accumulation Area No. 1	• Drummed waste storage area	• Waste material including shop wastes, solvents, POL, and spent fuels • In operation from 1950s to mid-1980s	• Soils from cont areas removed shipped offsite
SS03	Waste Accumulation Area No. 5	• Waste accumulation area for oil drums • Located north of Indian River	• Spills and leaks of oil drums • In operation during the 1960s and 1970s	• Oil drums rem 1980

TABLE 3-1
Indian Mountain LRRS
›gram Source Area and Area of Concern Summary

Comments	Previous Investigation Summary	1994 Investigation Summary	Conclusions	Recommendation Objectives
Some drums partially filled with oil, later drained and crushed Dump areas are downgradient of SS10 fuel releases and Waste Accumulation Area No. 6	• Records search conducted in 1985; no investigations performed	• Surface water sediment sampled • POL contaminants detected • GRO ranged from 0.095 to 1,800 mg/kg in sediment and from 0.41 to 280 mg/L in surface water • DRO ranged from 30 to 14,000 mg/kg in sediment and from 0.41 to 2.6 mg/L in surface water • Benzene, pentachlorophenol, and PCE measured above ARARs in surface water	• Compounds detected not directly attributable to SD01 • Contaminants related to SS10 releases • No human health or ecological risk	• Include SD01 data ir SS10 evaluation • Prepare a NFRAP document
Soils from contaminated areas removed and shipped offsite in 1984	• Site Inspection conducted in 1992 • Two subsurface soil samples collected • Pesticides and PCE detected at low concentrations	• Soil gas measurements collected • Surface and subsurface soils collected • Contaminants in soils include GRO, DRO, BTEX, and low levels of solvents	• Approximately 100 yards of contaminated soil present	• Carry forward to Feasibility Study
Oil drums removed in 1980	• 1985 Phase I report concluded further investigation needed but no previous investigations have been conducted	• Subsurface soil samples and soil gas samples collected around a metal detector survey anomaly • Subsurface soils primarily contained metals • Investigation centered on potential for contaminant migration to water-supply well • No groundwater encountered at SS03	• SS03 is not a source of contamination for the water-supply well	• Prepare a NFRAP document

	Recommendations Objectives
—not to	• Include SD01 data in SS10 evaluation • Prepare a NFRAP document
-ds	• Carry forward to Feasibility Study
if	• Prepare a NFRAP document

TABL
Indian Mou
Installation Restoration Program Sour

Source Area/ AOC	Former Site ID	Description	Material Disposed of/ Dates of Operation	Commen
LF04	Landfill No. 1	• Four disposal areas (A,B,C and D) near the gravel borrow pit next to Utopia Creek • LF04 is approximately 4 acres with landfill areas separated by small trees and vegetation	• Wastes buried at LF04 include garbage, scrap lumber, shop wastes, and metal from demolition operations • Portions of LF04 were in operation from 1953 to 1977; other areas of LF04 have no operational history	• Disposal area B during 1994 site other disposal a identified and sa through disturbe vegetation obse

TABLE 3-1
Mountain LRRS
Source Area and Area of Concern Summary

mments	Previous Investigation Summary	1994 Investigation Summary	Conclusions	Recommendations Objectives
area B identified 94 site visit; posal areas and sampled listurbed soil and n observations	• Toluene and DDT detected in one surface soil sample from the 1992 Site Inspection; arsenic detected above 1992 background concentrations	• Sediment and subsurface soil samples collected • Two monitoring wells installed and sampled • Pesticides detected in sediment sample • Several inorganics detected above background concentrations in subsurface soils • Carbon tetrachloride and chloroform detected in both monitoring wells at low levels • Surface water, overland flow determined not likely to act as migration pathway toward Utopia Creek	• No risk found for human or ecological receptors • No detections of contaminants from LF04 in Utopia Creek	• Prepare a NFRAP document

TAB
Indian Mo
Installation Restoration Program Sou

Source Area/ AOC	Former Site ID	Description	Material Disposed of/ Dates of Operation	Comme
LF05	Landfill No. 2	• LF05 is 1 acre, located north of the runway on the eastern edge of Miner Road • Portions of LF05 are still active	• Waste disposed at LF05 includes incinerator ash, wood, metal, oil filters, drums, fuel absorbent, spill residues, paint, and debris	• The active port LF05 was not investigated du 1994 site visit; downslope are surface water were investigat

ɜLE 3-1
ıuntain LRRS
ırce Area and Area of Concern Summary

ınts	Previous Investigation Summary	1994 Investigation Summary	Conclusions	Recommendations Objectives
ːion of ıring the however, as of ːollection ːed.	• Two co-located surface and subsurface soil samples collected during the 1992 Site Inspection • Pesticides detected in all samples • Low levels of PCE and BTEX detected in subsurface soil samples	• Surface water, sediment, and subsurface soil samples collected • One monitoring well installed and sampled • Inorganics detected well above background levels in most media • Elevated levels of GRO, DRO, and metals found from a seep generated by a high precipitation event • Groundwater found in isolated area with no hydraulic communication with surface water at Lower Camp • Groundwater results reveal PCE, DRO, di-n-butylphthalate, cis 1,2-dichloroethylene, and bis(2-ethylhexyl) phthalate present	• Groundwater at LF05 localized and not in hydraulic communication with Lower Camp surface waters; not considered a complete exposure pathway for the human health risk evaluation • Some intermittent seeps do occur from LF05 • Subsurface analytical results do not suggest significant levels of contamination • No significant risks identified for human health • Inorganics such as aluminum, barium, and manganese, retained as result of surface water ecological risk evaluation	• Perform a quantitative ecological risk assessment for inorganics retained in surface water to determine if these contaminants can be eliminated as COPECs • Pending results of the quantitative risk assessment on inorganics in surface water, prepare a NFRAP document or carry forward to Feasibility Study

TABL
Indian Mou
Installation Restoration Program Sour

Source Area/ AOC	Former Site ID	Description	Material Disposed of/ Dates of Operation	Commer
LF06	Source 2: Waste Accumulation Area No. 4, Landfill Nos. 3 and 4	• Drummed waste storage area and non-permitted landfills • GRO, DRO, RRO found throughout landfills, with highest levels in stain areas • Waste accumulation area located adjacent (south) to runway • Landfills Nos. 3 and 4 located south of runway in wooded area along a geophone access road	• Waste Accumulation Area No. 4 was used as a drum storage area for fuels and miscellaneous wastes • Dates of operation from 1950s to 1960s • Located south of runway • Landfill No. 3 is 0.2 acres and was used from 1978-1980 to bury scrap metal, drums, wood, and other debris; located northwest of LF04 on west side of the drainageway intermittent creek • Landfill No. 4 is 0.2 acres and was used to bury drums from unknown uses; dates of operation also unknown; however, was in operation during the 1970s • Located northwest of LF04 on the east side of the drainageway	• WAA4 may hav misidentified by investigation tea Hundreds of 55 drums reported were not observ 1993. May hav mistaken AOC WAA4
SD07	Source 8: Runway/ Road Oiling	• Waste vehicle fluids were spread on the runway and roads	• Waste vehicle fluids and shop wastes including ethylene glycol, oil, and solvents used from the 1950s until 1984	• Oiled areas vis aerial photogra in the 1970s

BLE 3-1
ountain LRRS
urce Area and Area of Concern Summary

ients	Previous Investigation Summary	1994 Investigation Summary	Conclusions	Recommendations Objectives
iave been by the 1992 team. 55-gallon ed here erved in ave C 5 as	• One surface and one subsurface soil sample collected from WAA4 and Landfill No. 3 • Three surface and three subsurface soil samples collected at Landfill No. 4 • WAA4 detections included DDD, DDE, DDT, and benzene; all at low concentrations • Landfill No. 3 detections included DDD, DDE, DDT, and PCE; all at low concentrations • Landfill No. 4 detections included DDT and toluene	• Two soil borings drilled at WAA4 • Surface soil, subsurface soil, sediment, and surface water samples collected at various locations at landfill nos. 3 and 4 • No GRO or DRO detected in downslope surface water collection areas • No contaminants of concern detected in subsurface soils at WAA4	• Surface soil and shallow subsurface soil contamination present at Landfill Nos. 3 and 4 • Low levels of standing surface water contamination present at Landfill Nos. 3 and 4 • No detections of fuel contaminants in sediments downslope from landfills • No contamination identified at WAA4	• Prepare a NFRAP document
visible in graphs taken	• Ten surface soil samples collected in 1992 • Solvents, BTEX, and PCBs measured below ARARs in road samples • Pesticides, benzene, and solvents detected below ARARs in runway samples	• Two surface water and sediment sets collected from road • DRO, RRO, and solvents measured in roadside sediment • Two sediment samples collected downgradient of runway • Contaminants not detected above ARARs in any of the samples	• No human health or ecological risk	• Prepare a NFRAP document

TAB
Indian Mo
Installation Restoration Program Sou

Source Area/ AOC	Former Site ID	Description	Material Disposed of/ Dates of Operation	Comme
OT08	Source 11: White Alice Communications System (WACS)	• Former White Alice Communications (Radar) System at Upper Camp	• POL and PCBs used in transformers at the WACS • Active from 1958 to 1979 • WACS building demolished in 1986	• In 1985, PCB-contaminated were drumme removed from • OT08 is down SS10
SS09	Source 6: Waste Accumulation Area No. 3 and Spill/Leak Nos. 4 and 11	• Storage of fuel and shop wastes • Spill/Leak Nos. 4 and 11 include fuel spills and leaks at former power plant	• WAA No. 3 used to store waste oil, MOGAS, and other waste liquids • Used from 1950s to 1984 • Spill/Leak Nos. 4 and 11 include fuel release and leakage from fuel lines; spill occurred in 1976; line leakage dates unknown • Dates of operation unknown	• SS09 also incl MOGAS pads former transfo • Fuels present surface near M pads • Installation wa well located approximately downgradient

ABLE 3-1
Mountain LRRS
ource Area and Area of Concern Summary

ıments	Previous Investigation Summary	1994 Investigation Summary	Conclusions	Recommendations Objectives
CB- and POL- ted soil and oil ımed and rom OT08 ɔwngradient of	• Records search conducted in 1985; no investigations performed	• Surface soil, subsurface soil, sediment, and surface water samples collected • PCBs detected in soils at concentrations ranging from nondetect to 760 mg/kg • DRO detected at concentrations up to 14,000 mg/kg in soil • GRO detected at concentrations up to 7,700 mg/kg in soil	• No human health risk • OT08 contaminants pose ecological risk • SS10 contaminants were measured at OT08	• Carry forward to Feasibility Study
includes two ıads and a nsformer stand ɜent at ground ɜar MOGAS ı water-supply ɜd ɜtely 100 yards ient of site	• Surface soil and subsurface soil was collected in 1992 during Site Inspection; contaminants detected include pesticides	• Subsurface soil, surface soil, surface water, and sediment samples collected • Four monitoring wells installed • POL contaminants present in soils, groundwater, surface water, and sediment • Potential for contamination to migrate to the Indian River	• Potential human health risks associated with benzene • POL-contaminated subsurface soil, groundwater, surface water, and sediment present at SS09 • SS09 should be considered for remedial activities	• Carry forward to Feasibility Study • Monitor water-supply well

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Indian Mou
Installation Restoration Program Sour

Source Area/ AOC	Former Site ID	Description	Material Disposed of/ Dates of Operation	Comment
SS10	Source 3: Waste Accumulation Area (WAA) No. 6 and Spill/Leak Nos. 2, 5, 6, 7, 9, and 10	• Drummed waste storage area and areas of fuel releases at Upper Camp	• WAA No. 6: waste oil and other liquid wastes stored from the 1950s to the 1970s; some drums crushed and buried in place • Spill/Leak Nos. 2, 5, 6, 7, 9, and 10: releases of diesel fuel from 1973 to 1979, ranging in volume from 1,500 to 46,500 gallons	• Drums were cru buried at SD01 SS10 in 1984

ABLE 3-1
Mountain LRRS
ource Area and Area of Concern Summary

nents	Previous Investigation Summary	1994 Investigation Summary	Conclusions	Recommendations Objectives
e crushed and D01 and 34	• Soil gas, surface soil, surface water, and sediment were sampled in 1989 • Soil gas detections included benzene • Surface water contained benzene and TPH • Sediment contained TPH • Soils contained PCBs, pesticides, and arsenic • Samples collected downgradient in Sleepy Bear Creek drainage contained TPH	• Surface water, sediment, surface soil, and subsurface soil samples collected • POL and PCP contaminants detected • GRO detections at concentrations from nondetect to 740 µg/L in surface water • DRO detected at concentrations from nondetect to 27 mg/L • Maximum sediment concentrations of DRO and GRO were 8,200 mg/kg and 8,300 mg/kg • Subsurface soil samples contained DRO from nondetect to 36,000 mg/kg and GRO up to 20,000 mg/kg	• No human health risk • SS10 contaminants pose ecological risk • SS10 contaminants were measured at SD01 and OT08	• Carry forward to Feasibility Study

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Installation Restoration Program So

Source Area/ AOC	Former Site ID	Description	Material Disposed of/ Dates of Operation	Comm
SS11	Source 1: Spill/Leak Nos. 1, 3, and 8.	• SS11 consists of abandoned diesel storage tank, active diesel storage tanks, and fuel bladder tanks • Tanks 2 through 10 range in capacity from 10,126 gallons to 33,362 gallons; tank 10 is a 435,761-gallon deactivated diesel fuel tank • Located on the north side of the runway, west of the dome area	• Spill/Leak Nos. 1, 3, and 8 occurred at POL tanks 2 through 10 of 3,500 gallons, 29,000 gallons, and 33,000 gallons from 1973 to 1977 • Dates of operation for each tank or the fuel bladder area are unknown	• Phase I repor recommende investigation f but no investi been conduct • Area surrounc slopes to the northwest, wit surface water (1) flow north west to pond
AOC 1	None	• POL offloading pump at west end of runway	• Fuel leaks from POL offloading operations • AOC 1 is presently active	• Offloading are bermed or lin

TABLE 3-1
Mountain LRRS
Source Area and Area of Concern Summary

nments	Previous Investigation Summary	1994 Investigation Summary	Conclusions	Recommendations Objectives
port ıded on for SS11, estigation has ducted ounding SS11 the north- , with two ater drainages: orth (2) flow ond area	• No previous investigations have been conducted	• 38 soil gas points sampled • One surface water and two sediment samples collected • Twenty-three soil borings drilled • One monitoring well installed and sampled • SS11 groundwater determined to be isolated and not in hydraulic communication with surface waters at Lower Camp • Groundwater contaminated with GRO, DRO, and BTEX • GRO, DRO, RRO, and some BTEX detected in subsurface soil from the fuel bladder area increasing in depth to the north along the bedrock/permafrost layer • Surface in drainage from fuel bladder area contaminated with DRO	• Widespread subsurface soil contamination at SS11 • Data gap identified for surface soil and sediment contamination in drainage leading from fuel bladder area	• Complete additional surface soil and sediment sampling to characterize the extent of contamination in the drainage leading from the fuel bladder area • Carry to the Feasibility Study
g area is not or lined	• No previous investigations have been conducted	• Surface soil, subsurface soil, and sediment collected • POL detected in surface and subsurface soil • Bedrock approximately 1-2 feet below ground surface • No POL detected using field test kits at downgradient location	• Human health and ecological risk assessments not required • Limited soil and sediment fuel contamination	• Move AOC 1 to compliance program • No further action

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Indian Mo
Installation Restoration Program Sou

Source Area/ AOC	Former Site ID	Description	Material Disposed of/ Dates of Operation	Commer
AOC 2	None	• Nondirectional beacon building and transformer stand	• Identified for the presence of PCB contamination resulting from possible transformer leaks or maintenance • Dates of operation unknown	• One transforme present on the
AOC 3	None	• Dump area at the southwest end of the installation runway	• Material observed included vehicles, batteries, metal debris, drums, cable spools, and scrap wood • Dates of operation unknown	• Fill/waste mate appears to hav used to constru hardstand at th location
AOC 4	None	• POL receiving tank (aboveground)	• Possible fuel line or tank leaks/spills • Dates of operation unknown	• Area around ta bermed; no line present
AOC 5	None	• Drum disposal area located on south side of runway	• Drums observed with POL markings • Dates of operation unknown	• Most drums pre the surface or p buried
AOC 6	None	• Drum disposal area located on south side of runway	• Drums partially buried with POL markings • Dates of operation unknown	• Drums reporte liquid material; inspections did confirm the pre liquid materials

E 3-1
ıtain LRRS
e Area and Area of Concern Summary

s	Previous Investigation Summary	1994 Investigation Summary	Conclusions	Recommendations Objectives
s ınd	• No previous investigations have been conducted	• Eighteen field tests conducted for PCBs • Surface and subsurface soils sampled • No PCBs detected	• No PCB release has occurred	• No further action
l ɔeen the runway	• No previous investigations have been conducted	• PCB and petroleum hydrocarbon field tests conducted downgradient of dump area • Surface soil, subsurface soil, and sediment collected • Contaminants include DRO, RRO, and low levels of GRO, benzene, toluene, and miscellaneous metals • Contamination present at relatively low concentrations	• Human health and ecological risk assessments not required • No contaminant migration is occurring via subsurface soil and overland flow	• No further action
is s	• No previous investigations have been conducted	• Surface soil, subsurface soil, and sediment samples collected	• Human health and ecological risk assessments not required	• Move AOC 4 to compliance program • No further action
ent at rtially	• No previous investigations have been conducted	• Sediment and subsurface soils sampled • Contaminants include DRO, RRO, lead, cadmium, di-n-butyl phthalate, and carbon disulfide	• Low levels of fuel contamination in limited area	• No further action
contain ɔt ınce of drums	• No previous investigations have been conducted	• Sediment and subsurface soils sampled • Contaminants include DRO, RRO, carbondisulfide, radium, lead, and nickel	• Low levels of fuel contamination in a limited area	• No further action

TAB
Indian Mo
Installation Restoration Program Sou

Source Area/ AOC	Former Site ID	Description	Material Disposed of/ Dates of Operation	Comme
AOC 7	None	• Dump area at east end of runway, and sewage effluent ponds	• Sewage effluent ponds and surface water runoff to low water collection areas • Dates of operation unknown	• AOC 7 receive water runoff fr Lower Camp s areas except L SS09
AOC 8	None	• Incinerator building drainage pipe	• Unknown; possible hazardous waste • Dates of operation unknown	• AOC 8 believe overflow for th the hazardous storage buildin drain
AOC 9	None	• Abandoned sewage treatment facility	• Received sewage from Lower Camp via sewage pipe • Dates of operation unknown	• Consists of 4 a ground tanks v approximately capacity each • Tanks are part
AOC 10	None	• Belowground oil/water separator tank - Building 112 and 118	• Receives wastes from Buildings 112 and 118, such as waste oil, waste water, and miscellaneous shop wastes • Dates of operation unknown	• Building 112 is unusable beca partially collap Building 118 h use • Neither buildin contributing to oil/water sepa

NOTES:

ARARs = Applicable or Relevant and Appropriate Requirements
BTEX = benzene, toluene, ethylbenzene, and xylene
COPEC = Compounds of potential ecological concern
DDD = dichlorodiphenyldichloroethane
DDE = dichlorodiphenyldichloroethene
DDT = dichlorodiphenyltrichloroethane
DRO = diesel-range organics
GRO = gasoline-range organics
IRP = Installation Restoration Program
mg/kg = milligrams per kilogram

TABLE 3-1
n Mountain LRRS
ı Source Area and Area of Concern Summary

omments	Previous Investigation Summary	1994 Investigation Summary	Conclusions	Recommendations Objectives
receives surface unoff from all Camp source xcept LF04 and	• No previous investigations have been conducted	• Seven surface water and sediment samples collected • Contaminants in sediments include GRO, RRO, BTEX, and metals • Contaminants in surface water include GRO, DRO, TCE, TCA, and numerous metals	• Ecological risks were identified from carbondisulfide and 1,2,dichloroethene in sediments and aluminum, barium, vanadium, lead, and mercury in surface water	• Designate AOC 7 for inclusion in the IRP Program
believed to be an for the sump at ardous materials building floor	• No previous investigations have been conducted	• Sediment samples indicate no contaminants of concern are present above screening levels	• Human health and ecological risk assessments not required	• No further action
s of 4 above-tanks with mately 750-gallon each re partially full	• No previous investigations have been conducted	• Solid and liquid phase samples collected and composited for tank characterization (TCLP) • Toluene and bis(2-ethylhexyl) phthalate detected in sludge • No contaminants detected in liquid	• Human health and ecological risk assessments not required	• No further action
112 is currently e because of a collapsed roof; 118 has limited building is ting to the separator	• No previous investigations have been conducted	• Moderate levels of GRO, DRO, and bis(2-ethylhexyl) phthalate detected in liquid from AOC 10. • Trace levels of various compounds present, including total xylenes and PCE	• Human health and ecological risk assessments not required	• No further action

mg/L = milligrams per liter
NFRAP = No Further Response Action Planned
PCB = polychlorinated biphenyl
PCE = tetrachloroethene
POL = petroleum, oils, and lubricants
RRO = residual-range organics
TCLP = toxicity characteristic leaching procedure
TPH = total petroleum hydrocarbons

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TABLE 3-2
Summary of Past Installation Restoration Program Investigations
Indian Mountain LRRS, Alaska

Source Area (current name)	ES Record Search 1985	Phase II Report 1989	RI/PFS Report 1991	Final SI Report 1993	RI/FS 1995
SD01	Source 9 Dump Areas	Landfill	NA	Source 9	SD01
SS02	Source 5 WAA No. 1	WAA	NA	Source 5	SS02
SS03	Source 7 WAA No. 5	WAA	NA	Source 7	SS03
LF04	Source 4 Landfill No.1	Landfill	NA	Source 4	LF04
LF05	Source 10 Landfill No. 2	Landfill	NA	Source 10	LF05
LF06	Source 2 WAA No. 4, Landfill No. 3, Landfill No. 4	WAA, Landfills	NA	Source 2	LF06
SD07	Source 8 Road Oiling	Not Addressed	NA	Source 8	SD07
OT08	Source 11 White Alice Site	Not Addressed	NA	Source 11	OT08
SS09	Source 6 WAA No. 3, Spill/Leak Nos. 4 and 11	WAA	NA	Source 6	SS09
SS10	Source 3 WAA No. 6, Spill/Leak Nos. 2,5,6,7,9,10	WAA	NA	Source 3	SS10
SS11	Source 1 Spill/Leak Nos. 1,3,8	Not Addressed	NA	Source 1	SS11

Notes:
NA = Names not used
WAA = Waste Accumulation Area

There are currently 11 IRP source areas at Indian Mountain. All 11 source areas were identified during the Phase I Records Search (Engineering Science 1985). Two source areas (SS09 and SS10) were initially investigated as part of the Phase II, Stage 1 Confirmation/Quantification Report (Woodward-Clyde 1989). In 1991 these two source areas were also investigated as part of the Stage II Remedial Investigation/ Preliminary Feasibility Study (Woodward-Clyde 1991). Additional sampling was performed in 1989 and 1991; however, that sampling was not specific to IRP source areas.

In 1993 a site investigation was performed at Source Areas SS02, LF04, LF05, LF06, SD07, SS09, and SS10 (Woodward-Clyde 1993). The RI/FS conducted in July 1994 included all source areas and AOCs listed in Table 3-2. The AOCs were identified during a site survey conducted in May 1994.

Table 3-1 provides the current status of each source area and AOC. Appendix B provides additional information on IRP technical documents and the Installation Restoration Program Information Management System (IRPIMS) status.

3.2 ENVIRONMENTAL COMPLIANCE PROGRAM STATUS

Environmental compliance activities at Indian Mountain LRRS are being conducted in coordination with environmental restoration activities under the IRP. Environmental compliance activities address fuel storage-tank sites, hazardous materials management, closure of active units, solid waste, including asbestos and PCBs, and water discharges. All ECP sources and activities are listed in Table 3-3. Some remedial response and corrective actions will be completed under the IRP, while others, typically related to active or closing active units, will be managed as compliance issues.

Note: 611 CES to confirm and provide additional information.

TABLE 3-3

Compliance Projects and Status (Non-USTs)
Indian Mountain LRRS

Project	Status	Regulatory Program
Hazardous materials/waste management	Hazardous wastes are stored at Building No. 125 and transported to Elmendorf AFB, DRMO, for disposal by licensed subcontractor	Alaska RCRA program
PCB storage, inspection/removal	Unknown	TSCA regulations
NPDES sampling	Unknown	NPDES permit
Pollution prevention program	Unknown	Unknown

Notes:

PCB = Polychlorinated biphenyls
NPDES = National Pollution Discharge Elimination System
AFB = Air Force Base
DRMO = Defense Reutilization and Marketing Office
TSCA = Toxic Substance Control Act
RCRA = Resource Conservation and Recovery Act

3.2.1 Underground Storage Tank Sites

There is currently one UST on the installation. This UST, located at the Lower Camp, is an oil/water separator tank for the vehicle maintenance building (Building 118). The tank has a ____ gallon capacity. On 5 September 1991, the only fuel containing UST on the installation was removed. The tank, a 6,000 gallon diesel storage tank, was used as a day tank for the back-up generator for operations at the Upper Camp. The tank piping system was also removed. During the tank removal, two subsurface soil samples were collected for contaminant characterization. The analysis, EPA method 8100 EPH, indicated the presence of diesel fuel at 107 parts per million in one sample, and less than 30 parts per million in the second sample. The tank and piping were crushed and disposed of onsite. Table 3-4 provides information regarding this UST and the aboveground storage tanks (ASTs) at the installation.

Note: 611 CES to confirm and provide additional information.

3.2.2 Aboveground Storage Tank Sites

There are currently 19 ASTs on the installation. Of those, ____ are currently in use. The ASTs are part of the entire POL system, including the air field fuel off-loading area, pipelines, and bulk storage tanks. The fuel pipelines are exhibiting deflection due to age. Liners are absent from all bermed containment areas for all of the tanks.

Note: 611 CES to confirm and provide additional information.

3.2.3 Solid Wastes, Asbestos, PCBs, Other

In addition to the POL program, compliance activities include those listed below, and in Table 3-3:

TABLE 3-4

Indian Mountain LRRS Existing Storage Tanks

Tank Number	Tank Type	Date Installed	Size (Gallons)	Status	Material
1	Bulk Diesel	Unknown	10,000	Unknown	Steel
2	Bulk Diesel	Unknown	12,220	Unknown	Steel
3	Bulk Diesel	Unknown	12,220	Unknown	Steel
4	Bulk Diesel	Unknown	12,200	Unknown	Steel
5	Bulk Diesel	Unknown	12,200	Unknown	Steel
6	Bulk Diesel	Unknown	12,200	Unknown	Steel
7	Bulk Diesel	Unknown	10,126	Unknown	Steel
8	Bulk Diesel	Unknown	33,362	Unknown	Steel
9	Bulk Diesel	Unknown	33,362	Unknown	Steel
10	Bulk Diesel	Unknown	15,000	Unknown	Steel
11	Bulk Diesel	Unknown	4,276	Unknown	Steel
21	Bulk MOGAS	Unknown	2,005	Unknown	Steel
50	Day Diesel	Unknown	850	Unknown	Steel
51	Day Diesel	Unknown	25	Unknown	Steel
52	Day Diesel	Unknown	25	Unknown	Steel
53	Day Diesel	Unknown	25	Unknown	Steel
54	Day Diesel	Unknown	25	Unknown	Steel
55	Day Diesel	Unknown	150	Unknown	Steel
56	Day Diesel	Unknown	155	Unknown	Steel
Unknown	OWS	Unknown	Unknown	Unknown	Unknown

Notes:

OWS = Oil water separator
MOGAS = Motor vehicle gasoline

- hazardous materials management in accordance with RCRA requirement;
- PCB disposal in accordance with the Toxic Substance Control Act (TSCA), as amended, and EPA PCB policy;
- sampling and reporting in accordance with the National Pollutant Discharge Elimination System (NPDES) permit;
- establishing a pollution prevention program; and
- solid waste disposal in accordance with the Alaska Solid Waste Program.

Note: Additional compliance activities and program status to be provided by 611 CES.

3.3 STATUS OF COMMUNITY INVOLVEMENT

Community relations activities that have or will take place at Indian Mountain LRRS include the following:

- Community Relations Interviews. In March 1995, community interviews will be conducted with the residents of Hughes, Alaska, the Tannin Chiefs Conference, and representatives of community organizations. The purpose of these interviews is to obtain information about community concerns and information needs that would assist in developing the community relations plan (CRP) for the site.
- Community Relations Plan. The Indian Mountain LRRS CRP is scheduled to be completed in May 1995. The plan will provide background information about the regulatory process, the site, the surrounding community, current community concerns, and information needs regarding environmental cleanup work. Based on this information, the CRP will outline a program of activities to be conducted to

keep the public informed of site work and provide opportunities for public input in cleanup decisions.

- Information Repositories/Administrative Record File. In February 1995, two publicly accessible information repositories were established at Elmendorf AFB and the Hughes, Alaska town hall. They contain all documents used to form the basis for the selection of a cleanup action under CERCLA. In addition to general information materials (such as technical assistance grants information and general community relations materials), the repositories house a copy of the administrative record file. The file includes copies of technical documents and public information materials, such as newsletters and fact sheets. Updates will be made by the Air Force on a semiannual basis.

- Mailing List. An initial 179-person mailing list was prepared in early 1995. The list included federal, state, and local officials, news media representatives, native organizations, and environmental interest and community organizations. Throughout the cleanup process, individuals and organizations on the mailing list periodically receive community relations materials, such as fact sheets, newsletters, and meeting announcements.

- Newsletter. An environmental newsletter will be prepared on an as needed basis to keep the public informed of the progress of environmental cleanup activities at the station and of opportunities for public involvement. Copies of the newsletter will be distributed to all persons on the station mailing list and to 50 families in the nearby city of Hughes. Additional copies are placed in the information repositories.

- Fact Sheets. Fact sheets are prepared periodically to provide information about specific topics of environmental interest. As with newsletters copies of fact sheets are distributed to the mailing list and to Hughes residents and made available at information repositories.

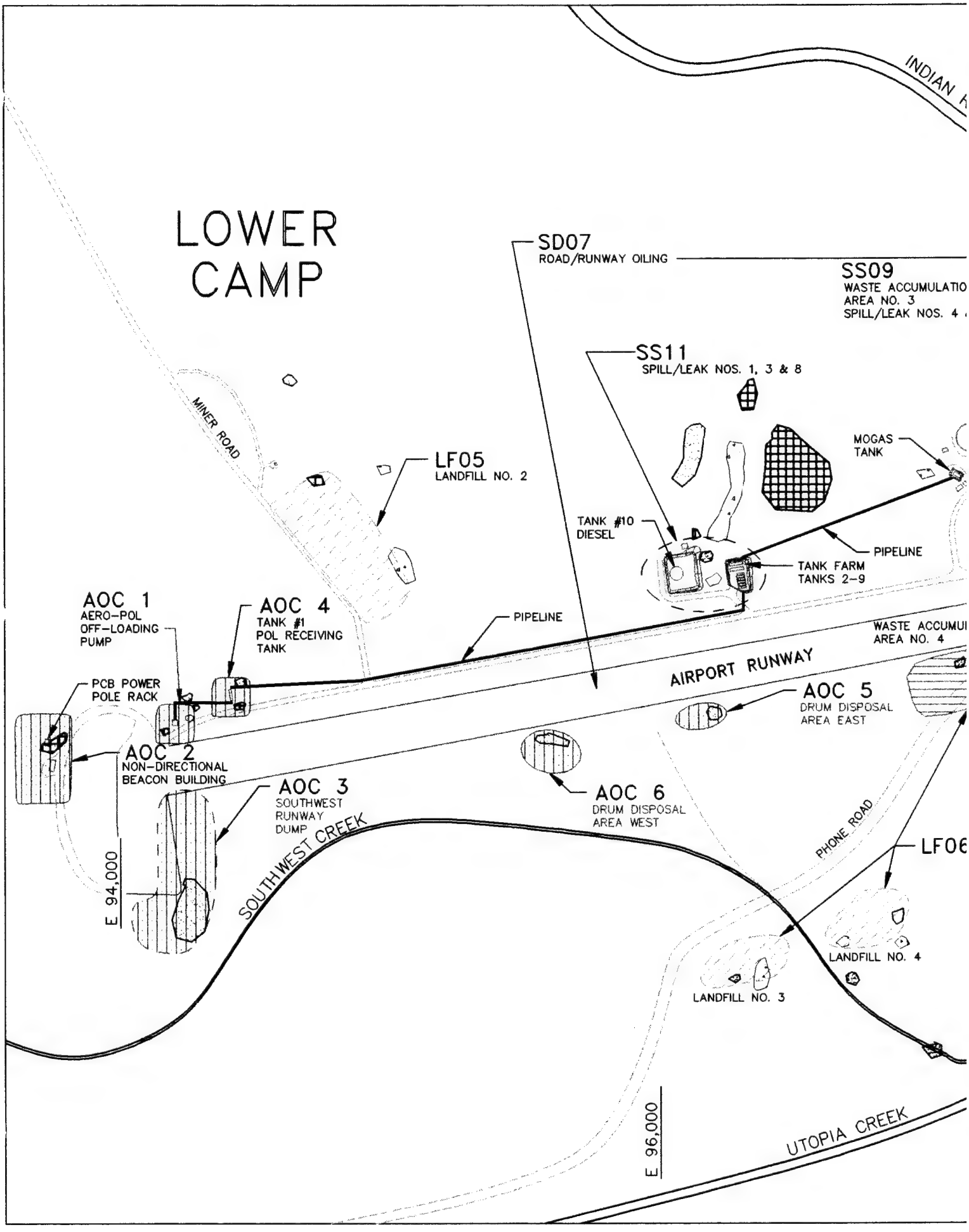
- Restoration Advisory Board. The Air Force will establish an RAB in March 1995. The RAB serves as a forum for discussions and exchange of information between federal/state agencies and the community regarding the cleanup program at the installation. The RAB provides an opportunity for members to provide input and participate in decision making, and to review the progress of cleanup activities. The RAB for Indian Mountain LRRS will be composed of representatives for the community of Hughes, Alaska; Tannin Chiefs Conference Inc.; the state; and the Air Force.

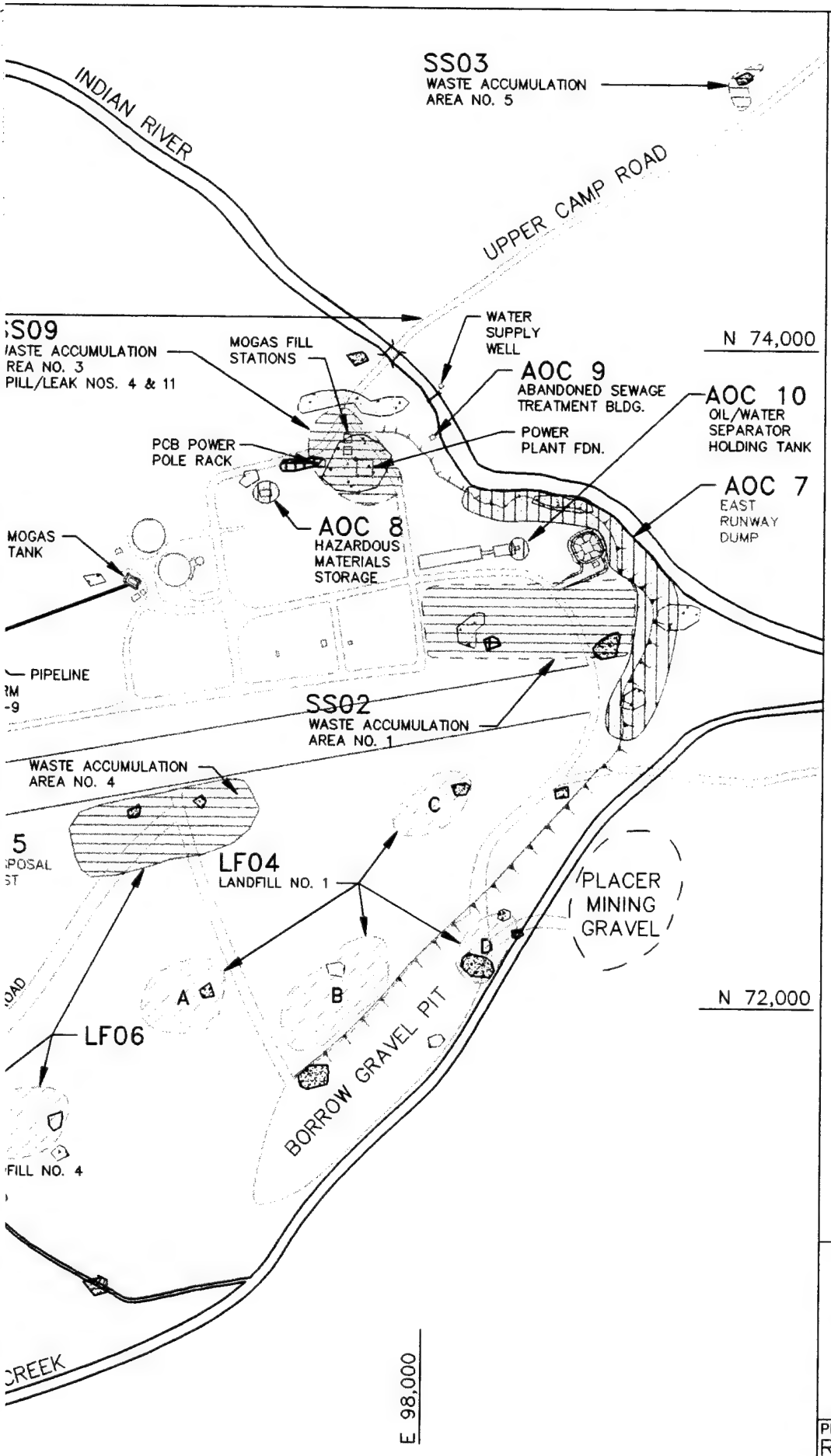
Note: 611 CES to confirm.

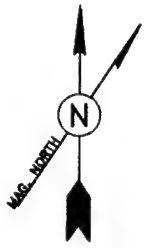
3.4 ENVIRONMENTAL CONDITION OF PROPERTY

All areas of the station have been categorized into three environmental condition groups based on all previous investigations at the station, including the 1994 field investigations. The three general groups are (1) areas of known contamination, (2) areas of no suspected contamination (ANSCs), and (3) unevaluated areas.

Plates 1 and 2 summarize the current status of information on the environmental condition of property for the three categories listed above for Lower Camp and Upper Camp. These plates have been reduced and are included as Figures 3-3 and 3-4 for reference. Criteria used for each category are briefly discussed below.


LOWER CAMP
INDIAN R
SD07
ROAD/RUNWAY OILING
SS09
WASTE ACCUMULATIO
AREA NO. 3
SPILL/LEAK NOS. 4
SS11
SPILL/LEAK NOS. 1, 3 & 8
MINER ROAD
LF05
LANDFILL NO. 2
MOGAS
TANK
TANK #10
DIESEL
PIPELINE
TANK FARM
TANKS 2-9
AOC 1
AERO-POL
OFF-LOADING
PUMP
AOC 4
TANK #1
POL RECEIVING
TANK
PIPELINE
WASTE ACCUMUL
AREA NO. 4
AIRPORT RUNWAY
PCB POWER
POLE RACK
AOC 5
DRUM DISPOSAL
AREA EAST
AOC 2
NON-DIRECTIONAL
BEACON BUILDING
AOC 3
SOUTHWEST
RUNWAY
DUMP
AOC 6
DRUM DISPOSAL
AREA WEST
PHONE ROAD
LF06
SOUTHWEST CREEK
E 94,000
LANDFILL NO. 4
LANDFILL NO. 3
E 96,000
UTOPIA CREEK





MAGNETIC DECLINATION : 24° 42'
ANNUAL RATE OF CHANGE : 4.1'
U.S.G.S. EPOCH 1985

LEGEND

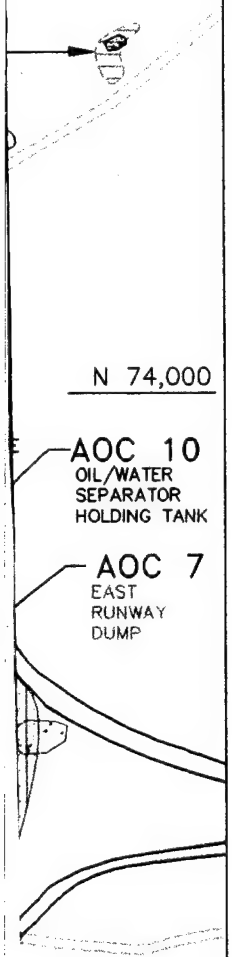
- BUILDINGS
- GRAVEL ROADS
- RIVER, STREAM, OR CREEK
- ESCARPMENT
- CULVERT
- APPROXIMATE WASTE ACCUMULATION AREA LOCA
- APPROXIMATE LANDFILL LOCATION AREA
- APPROXIMATE AREA OF CONCERN LOCATION
- UNEVALUATED AREAS
- CONTAMINATION ABOVE ACTION LEVELS
- CONTAMINATION BELOW ACTION LEVELS
- AREA OF NO SUSPECTED CONTAMINATION

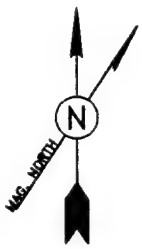
200 0 200 400

INDIAN MOUNTAIN
LONG RANGE RADAR STA

ENVIRONMENTAL CONDITIO
OF PROPERTY
LOWER CAMP

PROJ. MGR.	ACAD FILE NO.	FIGURE NO.
R. HENRY	FIG3-3	3-3
DRAWN BY	PROJ. NO.	DATE
HUNTER	05-G-46200	2/1





MAGNETIC DECLINATION : 24° 42'
ANNUAL RATE OF CHANGE : 4.1'
U.S.G.S. EPOCH 1985

LEGEND

- BUILDINGS
- GRAVEL ROADS
- RIVER, STREAM, OR CREEK
- ESCARPMENT
- CULVERT
- APPROXIMATE WASTE ACCUMULATION AREA LOCATION
- APPROXIMATE LANDFILL LOCATION AREA
- APPROXIMATE AREA OF CONCERN LOCATION
- UNEVALUATED AREAS
- CONTAMINATION ABOVE ACTION LEVELS
- CONTAMINATION BELOW ACTION LEVELS
- AREA OF NO SUSPECTED CONTAMINATION

200 0 200 400

INDIAN MOUNTAIN LONG RANGE RADAR STATION

ENVIRONMENTAL CONDITION
OF PROPERTY
LOWER CAMP

PROJ. MGR.	ACAD FILE NO.	FIGURE NO.
R. HENRY	FIG3-3	3-3
DRAWN BY	PROJ. NO.	DATE
HUNTER	05-G-46200	2/10/95

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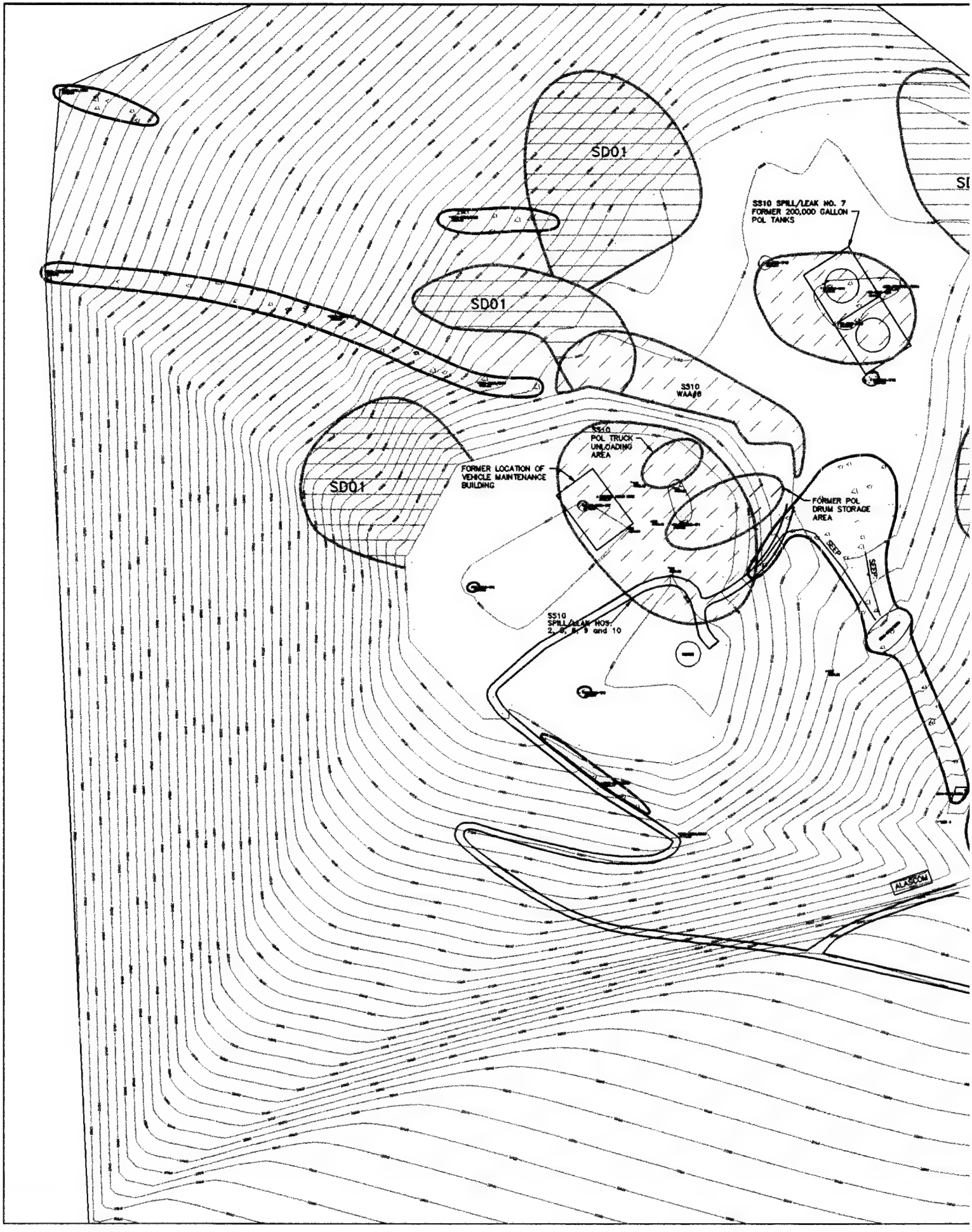
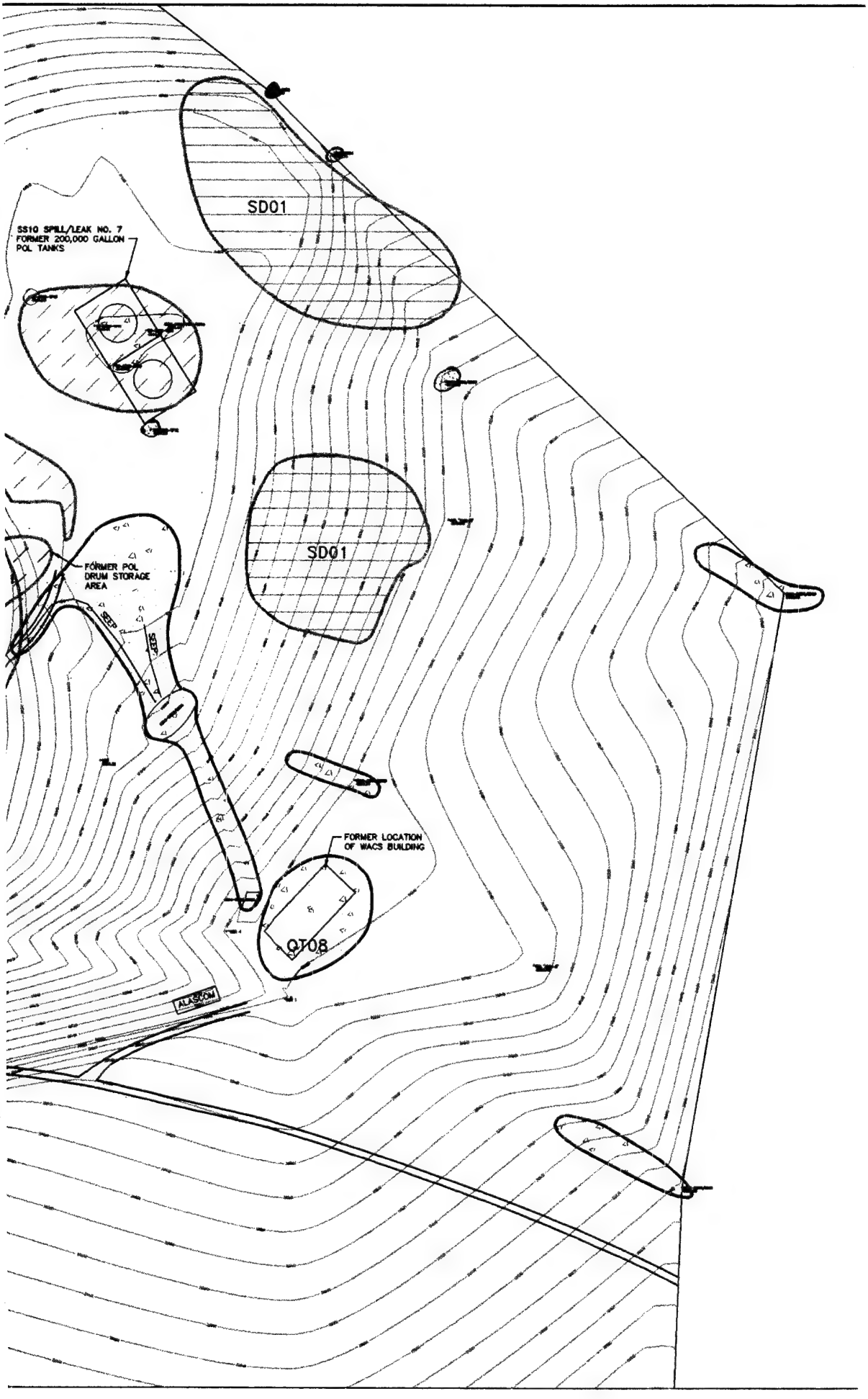
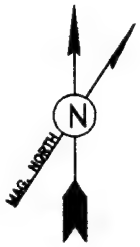

SD01
SD01
SD01
SS10 SPILL/LEAK NO. 7
FORMER 200,000 GALLON
POL TANKS
SS10
WAA#8
SS10
POL TRUCK
UNLOADING
AREA
FORMER LOCATION OF
VEHICLE MAINTENANCE
BUILDING
FORMER POL
DRUM STORAGE
AREA
SEEP
SEEP
SS10
SPILL/LEAK NOS.
2, 6, 8, 9 and 10
ALASCOM


SD01
SS10 SPILL/LEAK NO. 7
FORMER 200,000 GALLON
POL TANKS
SD01
FORMER POL
DRUM STORAGE
AREA
SEEP
SEEP
FORMER LOCATION
OF WACS BUILDING
QT08
ALASKAN



MAGNETIC DECLINATION : 24° 42'
ANNUAL RATE OF CHANGE : 4.1'
U.S.G.S. EPOCH 1985

LEGEND

DUMP AREAS

WASTE ACCUMULATION AND FUEL RELEASE AREAS

UNEVALUATED AREAS

CONTAMINATION ABOVE ACTION LEVELS

CONTAMINATION BELOW ACTION LEVELS

AREA OF NO SUSPECTED CONTAMINATION

125 0 125 250

INDIAN MOUNTAIN LONG RANGE RADAR STATION

ENVIRONMENTAL CONDITION OF PROPERTY
UPPER CAMP

PROJ. MGR.	ACAD FILE NO.	FIGURE NO.
R.HENRY	FIG3-4	3-4
DRAWN BY	PROJ. NO.	DATE
FMB	05-G-46200	2/14/95

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3.4.1 Areas of Known Contamination

Plates 1 and 2, and Figures 3-3 and 3-4, show contaminant source areas that have been placed in the Areas of Known Contamination category. Source areas where data and analytical results collected during the SI, RI, or other environmental investigations indicate that a release has occurred to environmental media were included in this category. This category is subdivided into two subcategories: one category for areas where media-specific, risk-based action levels or ARARs, have been exceeded, and the second for those source areas where contamination of environmental media is below risk-based levels or ARARs. Risk-based levels are those defined by the performance of risk evaluations for specific source areas. The list of potential ARARs was compiled during RI/FS Work Plan development. When both were available, the risk evaluation conducted for the RI used the lower concentration between the ARAR and risk-based level.

3.4.2 Areas of No Suspected Contamination

Areas of no suspected contamination have been identified at Indian Mountain LRRS, as shown on Plates 1 and 2 and in Figures 3-3 and 3-4. Source areas that have been categorized as having no suspected contamination were identified based on geographic location, lack of development, reviews of aerial photographs, results of the background sampling, and other environmental investigations. The main criteria used for evaluation of the Indian Mountain sites are as follows:

- Areas where historical records or sampling activities do not suggest that contamination is present.

- Sampling data from all SI or RI efforts were reported as nondetects, or detects that were below the background levels measured for the specific contaminant in that media.

3.4.3 Unevaluated Areas

Unevaluated areas are identified as those areas where the potential for current or past hazardous waste management activities is considered to be small based on aerial photograph and historical records review and site reconnaissance. All potentially contaminated areas were investigated during the RI. If any potential hazardous waste activity should be discovered at a later date, investigation will be carried out by the Air Force, and possible inclusion into the IRP program evaluated.

3.4.4 Suitability of Transfer by Deed of Installation Property

At this time the Environmental Condition of Property Maps (Plates 1 and 2) directly drive which areas at the installation are suitable for transfer by deed. The Environmental Condition of Property and associated criteria are preliminary and will be revised on at least an annual basis over the next several years or until restoration activities are completed.

Until the Environmental Condition of Property Map is revised to reflect more detailed ECP information, the map and discussion associated with suitability of transfer by deed areas at the base cannot be presented. In future revisions of the MAP, a Suitability of Transfer by Deed Map will be prepared, and revisions will be made in conjunction with revisions to the Environmental Condition of Property Map.

Currently, all areas at the base identified as having no suspected contamination and those areas identified with known contamination but with concentrations below action levels should be suitable for transfer by deed.

4.0 INSTALLATION-WIDE STRATEGY FOR ENVIRONMENTAL RESTORATION

This section summarizes the installation-wide environmental restoration and compliance strategy for Indian Mountain LRRS.

4.1 INSTALLATION RESTORATION PROGRAM

Eleven CERCLA source areas and 10 AOCs have been designated at the station. Neither zones nor OUs were designated. The installation was not divided into OUs because there were no logical groupings that would improve the management of environmental restoration. All IRP source areas are discussed separately. Table 3-1 provides a brief listing of each of these IRP source areas, the dates of operation, and the types of material disposed of at that source area. The following sections describe the current strategies for addressing the source areas.

4.1.1 IRP Source Areas and Strategies

The following paragraphs briefly describe the current environmental restoration strategy for each area. The strategy presented is a summary of the status of each source area, based on the findings of the RI field work, and previous sampling events. The current strategy for each IRP source area is included as part of the status. In general, the strategy is to complete RAs by the year ____. To this end, all 11 source areas will be recommended either for NFRAP or remedial action. All source areas recommended for NFRAP will be presented in appropriate documentation and submitted to ADEC. All IRP source areas proposed for remedial action will be carried into the FS to identify potential RAs.

Source Area SD01. During the 1994 RI field investigation, contaminants associated with landfilling operations were not detected. Therefore, Source Area SD01 will be evaluated as part of Source Area SS10.

Source Area SS02. POL-related contaminants were detected in soils at this source area. Based on the contaminant concentrations detected, and the likelihood for ecological exposure, SS02 has been carried through to the feasibility study stage for remediation consideration.

Source Area SS03. Based on the findings of the 1994 RI field work, SS03 has been proposed for NFRAP documentation.

Source Area LF04. Contaminants detected in soils and water at and near LF04 did not exceed human health or ecological risk, therefore LF04 has been proposed for NFRAP documentation.

Source Area LF05. Soil and water samples were collected as part of the 1994 RI field work. Contamination was detected in groundwater at concentrations exceeding Federal maximum contaminant levels (MCLs); however, the ground water has been shown to be localized and not in communication with surface waters near the installation. Therefore, LF05 has been proposed for NFRAP documentation.

Source Area LF06. Source Area LF06 comprises two landfill areas and one waste accumulation area. Based on the findings of the 1994 RI field work, LF06 has been proposed for NFRAP documentation.

Source Area SD07. This source area includes road and runway oiling. Sampling conducted during the 1994 RI field work has shown that contamination is not directly attributable to the application of oils and wastes to the runway and roads. Therefore, SD07 has been proposed for NFRAP documentation.

Source Area OT08. Source Area OT08 is the location of the former WACS system at the upper camp. Sampling conducted during the 1994 RI field work showed the presence of PCB contamination in soils. Source Area OT08 has been carried into the FS for remediation consideration.

Source Area SS09. Source Area SS09 has been documented to have had POL-related spills/ leaks and was also a waste accumulation area. Results of the 1994 RI field work have shown the presence of POL contamination in subsurface soil and groundwater. Given the concentration of POL contaminants and the location of the source area to the Installation drinking water supply well, this source area has been carried into the FS for remediation consideration.

Source Area SS10. This source area is located at Upper Camp and consists of multiple fuel spills and leaks. POL-related contamination was detected in surface soils, sediment, subsurface soil, and groundwater at this source area. Based on the contaminant concentrations and extent, Source Area SS10 has been carried into the FS for remediation consideration.

Source Area SS11. Source Area SS11, located at Lower Camp, is an area where numerous spill and leaks of fuel have been documented. Sampling conducted during the RI filed work has shown the presence of POL-related contamination is subsurface soils and surface soil. Based on the RI findings, this source area has been carried into the FS for remediation consideration.

4.1.2 AOC Designations and Strategies

During a site visit conducted in May 1994 with the Air Force and ADEC, various areas were identified as possible contaminated areas. Ten AOCs were identified and numbered consecutively. Table 3-1 describes the AOCs identified. Sampling conducted at the AOCs provided information regarding contaminant type and

distribution. The data generated during the 1994 RI field season indicated that all AOCs, except AOC 7 did not exhibit contamination in excess of ARARs. AOC 7 was identified, based on contaminant type and distribution, as requiring treatment at the feasibility study stage. The current strategy for the AOCs, excluding AOC 7, is to prepare NFRAP documentation. AOC 7 will be carried into the FS.

4.1.3 Sequence of Source Areas/AOCs

The Indian Mountain project team will develop a comprehensive strategy to sequence all source areas and AOCs to address all past contaminant releases associated with the areas. The environmental response strategy will also provide the following:

- target source areas and AOCs requiring early or interim RAs;
- streamline the document review process by defining a specific review cycle from submittal of draft FS to the signing of the final DD; and
- initiate RD during the FS and DD review process to ensure that final designs are in place as soon as possible after the DD is signed.

The sequence will be derived by addressing source areas and AOCs that pose the greatest potential risk to human and ecological receptors, and those areas that are most likely to proceed to remedial action. For planning purposes, consideration will be given to those areas that will undergo similar RAs. The sequence is depicted below, along with associated documents and deliverable dates.

- OT08
  - Draft RI submitted December 1994
  - Draft FS due February 1995
  - Final DD not scheduled

- SS09
  - Draft RI submitted December 1994
  - Draft FS due February 1995
  - Final DD not scheduled
- SS10
  - Draft RI submitted December 1994
  - Draft FS due February 1995
  - Final DD not scheduled
- SS11
  - Draft RI submitted December 1994
  - Draft FS due February 1995
  - Final DD not scheduled
- SS02
  - Draft RI submitted December 1994
  - Draft FS due February 1995
  - Final DD not scheduled.

Concurrent with the strategy for addressing the source areas that will probably proceed to RA, a strategy for addressing NFRAP source areas and AOCs will also be developed.

Note: 611 CES to provide information regarding the sequence strategy.

4.1.4 Removal Actions and Treatability Studies

To date, there have been no removal actions or treatability studies conducted at the Installation. Table 4-1 summarizes removal actions and treatability studies planned as part of the Indian Mountain environmental restoration strategy.

TABLE 4-1

Planned Removal Actions and Implementation of Remedial Alternatives

Source Area	Action	Objective	Timeframe
SS02	To be Determined	Reduce soil POL contamination to acceptable levels.	To Be Determined
OT08	To Be Determined	Remove or reduce PCB contamination to acceptable levels.	To Be Determined
SS09	To Be Determined	Reduce POL contamination to acceptable levels	To Be Determined
SS10	To Be Determined	Reduce POL contamination to acceptable levels	To Be Determined
SS11	To Be Determined	Reduce POL contamination to acceptable levels	To Be Determined

4.1.5 Community Relations Strategy

The Indian Mountain Project Team will adopt the following strategy to support a proactive community relations program at the installation:

- The Office of Public Affairs, 611 CES/CEVR, Elmendorf AFB, serves as the Community Relations Coordinator for the Indian Mountain community relations program. They serve as the focal point for all communication between the public and the Air Force about environmental cleanup programs. They provide information about activities and respond to community inquiries and concerns, answering questions directly or referring the caller to persons knowledgeable about the subject. Records of all such inquiries will be maintained by the coordinator to reflect the nature of public concerns.

- The CRP will be updated or amended, as needed, to reflect changing conditions, concerns, and information needs.

- A survey of residents/workers on the Installation was conducted to better identify levels of interest and concerns about contamination sources. Residents of the nearby community of Hughes, Alaska, will also be interviewed to determine their interests and concerns. Information obtained from the survey was and will be used to update the CRP and tailor community relations activities to specific community interests.

- The administrative record file in the Environmental Management Office is updated quarterly. Similarly, the publicly accessible administrative record files at the

information repositories at the Hughes, Alaska, Town Hall will be updated quarterly.

- Informal and formal public meetings and workshops are held periodically throughout the cleanup process to present remedial alternatives for specific RAs or to provide a progress report on cleanup activities.

- An RAB will be established to provide a forum for communication among the Air Force, local officials, and the community. Members of the RAB include representatives of the Air Force, the 611 CES/CEVR, the State of Alaska, Tanana Chiefs Conference, and residents of Hughes, Alaska. The committee will meet to discuss the current and future plans for remediation at the Installation. Comments and recommendations of the RAB will be forwarded to the USAF, 611 CES/CEVR, and ADEC for their consideration.

- Fact sheets are published periodically to describe regulatory requirements of the remediation process and explain technical issues. Fact sheets are coordinated with EPA and ADEC, where appropriate. Fact sheets are (1) sent to everyone on the mailing list, (2) distributed at public meetings or workshops, and (3) maintained in the information repositories.

- A newsletter will be prepared and distributed to everyone on the mailing list. The newsletter provides a status report and update on all environmental cleanup programs being conducted at the Installation.

- Press releases are distributed to local newspapers and radio and television stations that are on the mailing list. Media inquiries are directed to the coordinator for disposition.

- The Installation mailing list is updated quarterly. Fact sheets, newsletters, and notices of significant activities are sent to all of those on the mailing list. Any individual or group wishing to be included on the mailing list will be added.

4.1.6 General Remedy Selection Approach

Remedies will be selected in accordance with CERCLA requirements. The Indian Mountain LRRS Project Team will involve all project team parties in the remedy selection process at the time of selection. Particular attention will be given to the following during the evaluation of alternatives.

- ARARs. Source-specific ARARs for anticipated RAs will be fully identified as early as possible throughout the RI/FS process.

- ARAR Waivers. The effectiveness of alternatives in reducing concentrations of contaminants to chemical-specific ARARs will be evaluated. Waivers will be considered where treatment to standards is technically impractical.

- Land Use/Risk Evaluation. Risk evaluation protocols will incorporate future land use in exposure scenarios where future uses are known. As required, future land use designations will be continuously evaluated, and proposed changes to the base comprehensive plan (BCP) will be made to facilitate risk evaluation approaches.

- Alternative Concentration Limits (ACLs). ACLs will be considered during the FS as groundwater protection standards to be applied at points of compliance for certain onsite plumes.

- Treatability Studies. Effective treatability studies will be incorporated into decision documents (DDs) when needed as a foundation for performance-based RAs.

- Applicable Remedies. The presumptive remedy selection approach advocated in EPA's 30-day study will be applied in selected cases. In other cases, focused FSs will be developed for specific sites.

Note: 611 CES to confirm, eliminate, or add criteria as appropriate.

4.1.7 Remedy Selection Approach for Petroleum-Contaminated Soils

Indian Mountain LRRS has source areas where soil is contaminated with POLs. Regulations pertaining to cleanup of contaminated soils have been promulgated under the Alaska Department of Environmental Conservation Interim Guidance for Non-UST Contaminated Soil, 17 July 1991. The Alaska Cleanup Matrix score sheet is included in Table 4-2. The actual cleanup level may be based on the matrix score, which is a calculated level derived from the depth to groundwater, the mean annual precipitation, the soil type, the potential receptors, and the volume of contaminated soil.

Remedy selection may ultimately be based on risk-based cleanup levels rather than on calculated cleanup levels. Where future land use scenarios are known, considering current and future receptors can aid in determining whether certain pathways actually exist. Also, the exposure scenario for remaining pathways may be drastically altered based on future land use scenarios. This approach eliminates unrealistic cleanup requirements when the risk to human health or the ecology is very low or nonexistent. If future pathways are not known or cannot be determined by considering calculated cleanup levels will be determined, remedy selection and cleanup levels for diesel range organics (DRO), gasoline range organics (GRO), benzene, or total BTEX (benzene,

TABLE 4-2
Guidance for Using Alaska Cleanup Matrix
(UST and Non-UST Soil)

I. Matrix Score Sheet			
1.	Depth to subsurface water		
	< 5 feet	(10)	
	5-15 feet	(8)	
	15-25 feet	(6)	
	25-50 feet	(4)	
	> 50 feet	(1)	
2.	Mean Annual Precipitation		
	> 40 inches	(10)	
	25-40 inches	(5)	
	15-25 inches	(3)	
	< 15 inches	(1)	
3.	Soil Type (Unified Soil Classification)		
	Clean, coarse-grained soils	(10)	
	Coarse-grained soils with fines	(8)	
	Fine-grained soil (low OC)	(3)	
	Fine-grained soils (high OC)	(1)	
4.	Potential Receptors		
	Public well within 1,000 feet, or private wells within 500 feet	(15)	
	Municipal/private well within 1/2 mile	(12)	
	Municipal/private well within 1 mile	(8)	
	No known well within 1/2 mile	(6)	
	No known well within 1 mile	(4)	
	Nonpotable groundwater	(1)	
5.	Volume of contaminated soil		
	> 500 cubic yards	(10)	
	100-500 cubic yards	(8)	
	25-100 cubic yards	(5)	
	> De minimis - 25 cubic yards	(2)	
	De minimis	(0)	

Matrix Score		Cleanup Level in mg/kg			
		Diesel		Gasoline/Unknown	
		Diesel-Range Petroleum Hydrocarbon	Gasoline-Range Petroleum Hydrocarbon	Benzene	BTEX
Level A	> 40	100	50	0.1	10
Level B	27-40	200	100	0.5	15
Level C	21-26	1,000	500	0.5	50
Level D	< 20	2,000	1,000	0.5	100

toluene, ethyl benzene, and xylenes). A list of preferred remedies for POL-contaminated soils is presented in Table 4-3. The advantages and disadvantages of each possible remedy are described and will be considered on a site-specific basis.

If it is determined that an action must be taken at a site, several potential technologies for remediation will be considered. If necessary, groundwater modeling may be performed to determine if POL products will disperse or decay to levels that will not pose a risk to receptors. Groundwater monitoring may be conducted parallel to intrinsic remediation to determine the effectiveness of the technology and the accuracy of the model.

If a time-critical removal action (interim) or a remedial action is deemed necessary for contaminated soils, the action may be conducted on a expedited basis employing a remediation technique that is more quickly implementable.

4.1.8 Remedy Selection Approach for PCB-Contaminated Soils

Soils at one source area have been identified as being contaminated with PCBs. Regulations pertaining to the cleanup of PCB-contaminated soils have been promulgated under the Toxic Substance Control Act (TSCA). The cleanup level is based on the actions levels set forth in TSCA.

Several potential remediation technologies have been identified for PCB contaminated soils. Table 4-4 describes the preferred alternatives. These alternatives were identified in consideration of source area and Installation conditions, accessibility to the Installation and source area, implementability, and mobilization/demobilization.

If a time-critical removal action (interim) is deemed necessary for the PCB-contaminated soils, excavations may be necessary to remove the soils for storage until the remediation selection process is complete.

TABLE 4-3

Potential Remedial Technologies for POL-Contaminated Soils for the Indian Mountain LRRS

Treatment Technology	Advantages	Disadvantages
Intrinsic remediation/long term monitoring	• Cost effective • Naturally occurring, not labor intensive • Low maintenance	• Sometimes requires significant time period • Requires monitoring • Less effective in anaerobic conditions • Heavier/complex contaminants may not degrade
Composting	• Moderate cost • Effective for degrading organic contaminants • Able to accommodate large volumes of soil • Can operate in cold climates	• Some maintenance required • Requires excavation
Bioventing	• Relatively easy to install and maintain • Moderate cost	• Works effectively only in certain type soils
Thermal treatment	• Proven technology • Complete destruction of organic contaminants	• High cost • Hard to mobilize • Complex permits required • Requires excavation

TABLE 4-4

Potential Remedial Technologies for PCB-Contaminated Soils for the Indian Mountain LRRS

Treatment Technology *	Advantages	Disadvantages
Intrinsic remediation/long term monitoring (SS-II)	• Cost effective • Naturally occurring, not labor intensive • Low maintenance	• Requires significant time period • Requires monitoring • Less effective in anaerobic conditions • Heavier/complex contaminants may not degrade (PCBs)
Thermal desorption/ dechlorination (SS-IV)	• Effective for removing PCBs • Readily implemented in saturated soils • Moderate cost	• Difficult to mobilize • Requires excavation • Ineffective for PCBs without chlorinating or other processing
Incineration (SS-V)	• Proven technology • Complete destruction of organic contaminants • Unaffected by climate or soil conditions	• High cost • Difficult to mobilize • Requires excavation • Complex permits required

Notes:

* SS-I = No action

4.2 ENVIRONMENTAL COMPLIANCE STRATEGY

This section briefly summarizes the strategies for compliance activities at Indian Mountain LRRS. These activities include USTs, ASTs, RCRA, NPDES, and other compliance issues.

Note: 611 CES to confirm and provide additional information on compliance activities.

4.2.1 USTs

Activities may be scheduled in fiscal year (FY) 1995 to meet UST compliance requirements. These include the following:

- removal of _____ USTs in FY95;
- additional sampling of the former UST at Upper Camp; and
- monthly monitoring of tanks in use.

Note: 611 CES to confirm and update UST compliance activities.

4.2.2 ASTs

Activities may be scheduled for FY95 to meet AST compliance requirements. These include the following:

- sampling inactive tanks to determine content;

- replacement of the entire POL system, including air field off-loading areas, pipelines, and bulk storage tanks, and;

- relocating bulk storage tanks.

Note: 611 CES to confirm and update AST compliance activities.

4.2.3 Solid Waste, PCBs, Other

Activities may be scheduled for FY95 to meet other compliance requirements. These include the following:

- NPDES sampling; and

- review of Solid Waste permit for refuse disposal at the Installation landfill.

Note: 611 CES to confirm and update solid waste, PCB, and other compliance activities.

5.0 INSTALLATION RESTORATION PROGRAM AND ENVIRONMENTAL COMPLIANCE PROGRAM MASTER SCHEDULE

This section presents the Indian Mountain IRP master schedule of anticipated activities in the environmental restoration and compliance programs. Detailed schedules developed to support site-specific environmental restoration and compliance activities have not been developed at this time.

5.1 INSTALLATION RESTORATION PROGRAM

Figure 5-1 provides an overview of the IRP program schedule. The Indian Mountain IRP is estimated to be completed in approximately _____ years. Appendix A provides a summary of estimated fiscal year costs, and estimated cost summaries for the IRP program source areas.

Note: 611 CES to provide schedule and cost information.

5.2 COMPLIANCE SCHEDULE

The compliance schedule for Indian Mountain LRRS is shown in Figure 5-2. The overall schedule is based on operational schedules to manage USTs, ASTs, RCRA, PCB removal, and NPDES permitting. Estimated fiscal year costs for compliance activities are currently not available.

Note: 611 CES to confirm compliance programs and provide schedule.

5.3 PROJECT TEAM MEETING SCHEDULE

Communication is the key to the success of Indian Mountain's environmental restoration program. Team meetings will be held throughout the year to facilitate

information exchange among the Air Force, regulatory agency, and contractor team personnel. These meetings are critical to the planning and execution of restoration activities. The RPMs for the 611 CES/CEVR, EPA, and ADEC meet to discuss management, policy, or schedule issues. Table 5-1 lists the project team meetings scheduled for 1995.

Topics of discussion for future meetings will be developed through the course of remediation activities at Indian Mountain. As the meetings progress, more topics will be added for discussion. The following is a preliminary list of meeting topics:

- primary deliverable schedules;
- RI/FS requirements;
- community relations plan development;
- data quality objectives;
- site characterization objectives;
- conceptual site models;
- evaluation of proposed remediation; and
- review and revision of the MAP.

Note: 611 CES to confirm and provide additional topics.

Figure 5-1 Restoration Activity Schedule - Indian Mountain LRRS

The Restoration Activity Schedule has not been established at this time.

(intentionally blank)

Figure 5-2 Compliance Activity Schedule - Indian Mountain LRRS

The Compliance Activity Schedule has not been fully developed at this time.

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TABLE 5-1

Project Team Meeting Schedule

Date	Location	Participants
To Be Determined	To Be Determined	To Be Determined
To Be Determined	To Be Determined	To Be Determined
To Be Determined	To Be Determined	To Be Determined
To Be Determined	To Be Determined	To Be Determined
To Be Determined	To Be Determined	To Be Determined

(intentionally blank)

6.0 TECHNICAL AND OTHER ISSUES TO BE RESOLVED

This section summarizes technical and other issues relating to IRP and ECP activities that are not yet resolved. These issues include usability of historical analytical data, data gaps, information management, background levels of elements and compounds in soil and surface water, and risk evaluations.

6.1 DATA USABILITY

6.1.1 Project Team Action Items

The project team will perform the following activities:

- Continue evaluation of historical data to determine usability for risk evaluations and site characterization.
- Continue to ensure the usefulness of data collected during future project activities by continuing to implement and refine data quality management (DQM) procedures.
- Ensure that sampling and analysis plans are prepared according to Air Force and agency protocol.

6.1.2 Rationale

The Indian Mountain LRRS environmental restoration program has been underway since 1985 and several investigations have taken place. Historical data may be useful for filling data gaps in site characterizations and for risk assessment and remedial design. Both current and future data are critical to the ultimate selection of RAs that will protect human health and the environment.

6.1.3 Status/Strategy

Project team members will review historical and 1994 analytical data to determine the usability of the various data sets. All data review processes will consider the accuracy, precision, and technical specifications of data collection and laboratory QA/QC. Additionally, the project team will review future field and laboratory sampling plans with regard to Air Force DQM procedures and project data gaps.

Note: A formal review of historical and 1994 data by the project team is assumed.

6.2 INFORMATION MANAGEMENT

The project team will perform the following activities:

6.2.1 Project Team Action Items

- Establish a central electronic data library for analytical data, deliverables, and drawings.

- Ensure that the library is accessible and usable for all project activities.

- Develop contractor requirements for future data management (i.e. IRPIMS), installation maps, and remedial design drawings.

6.2.2 Rationale

Because the number of agencies and contractors associated with environmental work will increase as RAs are implemented and source areas closed, the importance of sharing data and information will increase. The most efficient method of data sharing to ensure consistent, quality products is to establish and maintain an electronic database of analytical

data and spatial data. Additionally, future evaluation of installation projects by the Air Force, agencies, and contractors will be simplified by access to such a database.

6.2.3 Status/Strategy

None of the historical or 1994 RI analytical data have been loaded into IRPIMS. All data from the RI were received in electronic format and were manipulated on a computer for site characterization and data evaluation. All historical data will be evaluated and decisions made regarding the benefits of entering past or future data into IRPIMS or creating a similar data management tool. Evaluation criteria will be developed based on the type, quality, and potential uses of the data. Based on this evaluation, the project team will decide if loading all data, or only select data sets, will be more valuable.

Note: It was assumed that the project team will review historical data and that portions of the data will be loaded into IRPIMS or into a similar system.

6.3 DATA GAPS

6.3.1 Project Team Action Items

The project team will perform the following activities:

- Identify data gaps for IRP and ECP areas at installation.
- Conduct project team meetings to determine how to address data gaps in future sampling efforts.

6.3.2 Rationale

Effective identification and resolution of data gaps will expedite and improve the quality of information used to develop RAs and source area closure plans. Additionally, following a team approach will result in a more complete environmental investigation.

6.3.3 Status/Strategy

During preparation of the RI/FS Report (Air Force 1995a), some data gaps were identified. Additional data gaps may be identified and plans for resolution developed during project team meetings.

Note: 611 CES is to provide information regarding compliance data types.

6.4 BACKGROUND LEVELS

6.4.1 Project Team Action Item

The project team will determine background concentrations of elements and compounds in the environment of Indian Mountain LRRS for evaluation of historical and 1994 RI data.

6.4.2 Rationale

A comparison of environmental data to background concentrations of elements in the soil, surface water, and sediment are necessary for risk evaluation and site characterization.

6.4.3 Status/Strategy

Background concentrations of inorganics in soil, sediment, and surface water were established for both camps during the 1994 RI (Air Force 1995a). Background levels

were measured at Lower Camp during a previous investigation (Air Force 1993a). The 1994 values were measured in samples collected upgradient or topographically separated from the disturbed areas of both Upper and Lower Camps. Both the geology of the region and the presence of historic mine works upstream of Indian Mountain LRRS resulted in many inorganic detections above ARARs. Both 95 and 99 percent upper tolerance limits were calculated, by media, for inorganics detected in background samples. These values were used to evaluate environmental samples with high inorganic concentrations. These values must be reviewed and approved by the project team.

6.5 RISK EVALUATION

6.5.1 Project Team Action Item

The project team will periodically review planned land use of the installation and surrounding areas and update exposure and risk assumptions developed for decision making.

6.5.2 Rationale

Anticipated or known land uses at Indian Mountain are useful for making exposure assessment assumptions that are incorporated into RA evaluation and selection processes. These assumptions must be updated as additional land use information becomes available. Additionally, the project team must review and approve risk assessment assumptions and conclusions.

6.5.3 Strategy

Project team meetings will be held to consider present and future land use plans for the installation. The team will also revise risk evaluation assumptions as necessary.

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7.0 REFERENCES

U.S. Air Force. 1995a. *Indian Mountain LRRS RI/FS Report.*

U.S. Air Force. 1995b (February 6). Indian Mountain files received from 611 CES real property department.

U.S. Air Force. 1994a. *Indian Mountain LRRS RI/FS Work Plan.*

U.S. Air Force. 1994b. *Indian Mountain LRRS RI/FS Sampling and Analysis Plan.*

U.S. Air Force. 1993a. *Final Site Investigation Report, Indian Mountain LRRS, Alaska.*

U.S. Air Force. 1991. *Installation Restoration Program, Remedial Investigation/ Preliminary Feasibility Study, Stage 2.*

U.S. Air Force. 1989. *Installation Restoration Program, Phase II, Confirmation/ Quantification Report - Stage 1.*

U.S. Air Force. 1985. *Installation Restoration Program, Phase I, Records Search Report.*

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APPENDIX A

FISCAL YEAR REQUIREMENTS/COSTS

Appendix A provides cost and schedule information regarding the implementation of the IRP activities at Indian Mountain. Included are Table A-1, which describes the estimated fiscal year cost summary for each IRP source area, and Table A-2, which describes the estimated cost summary, by phase, for work conducted.

TABLE A-1

Estimated Fiscal Year Cost Summary for Indian Mountain LRRS

IRP Source Area	1995	1996	1997	1998	1999	2000	2001	2002	2003	Total
SD01										
SS02										
SS03										
LF04										
LF05										
LF06										
SD07										
OT08										
SS09										
SS10										
SS11										

TABLE A-2

Estimated Cost Summary by Phase for Indian Mountain LRRS

Fiscal Year[a]	PA/SI	RI/FS	RD	RA	IRA	LTO	LTM	NFRAP	Total
1995									
1996									
1997									
1998									
1999									
2000									
2001									
2002									
2003									

Notes:

a = Year Funds Allocated
PA/SI = Preliminary Assessment/Site Inspection
RI/FS = Remedial Investigation/Feasibility Study
RD = Remedial Design
RA = Remedial Action
IRA = Interim Remedial Action
LTO = Long-Term Operation
LTM = Long-Term Monitoring
NFRAP = No Further Response Action Planned

APPENDIX B

INSTALLATION ENVIRONMENTAL RESTORATION DOCUMENTS

Appendix B contains information about the technical documents and investigation type for each source area and Area of Concern (AOC) at Indian Mountain. Included are Table B-1, Indian Mountain IRP Technical Documents, and Table B-2, Indian Mountain Source Area/AOC Investigation Phases. Table B-1 provides information about the year investigations were conducted, the source areas/AOCs investigated, deliverable dates and contractors, and the status of IRPIMS deliverables. Table B-2 provides information on specific IRP activities (PA/SI, RI/FS) that have been conducted at the source areas and AOCs.

TABLE B-1

Indian Mountain IRP Technical Documents

Year	Project Title	Sites Identified/Investigated	Deliverable Date/Contractor	IRPIMS Status
1985	Phase I - Records Search	SD01, SS02, SS03, LF04, LF05, LF06, SD07, OT08, SS09, SS10, SS11	1985, Engineering Science	Data loading not required
1989	Phase II, Stage I Confirmation/ Quantification Report	SS09, SS10	1989, Woodward-Clyde	Data loading not required
1991	Stage II Remedial Investigation/ Preliminary Feasibility Study	SS09, SS10	1991, Woodward-Clyde	Data loading not required
1993	Final Site Investigation Report	SS02, LF04, LF05, LF06, SD07, SS09, SS10	1993, Woodard-Clyde	Data loading not required
1994	Remedial Investigation/ Feasibility Study	SD01, SS02, SS03, LF04, LF05, LF06, SD07, OT08, SS09, SS10, SS11, AOC1, AOC2, AOC3, AOC4, AOC5, AOC6, AOC7, AOC8, AOC9, AOC10	Anticipated April 1995, Jacobs Engineering	To be determined

Notes:

IRP = Installation Restoration Program
IRPIMS = Installation Restoration Program - Information Management System

TABLE B-2

Indian Mountain Source Area/AOC Investigation Phases

Source Area/ AOC	Records Search	RI/FS	SI	RI/FS	RD/RA	Other	Comments
SD01	1			5			
SS02			4	5			
SS03	1			5			
LF04	1		4	5			
LF05	1		4	5			
LF06	1		4	5			
SD07	1		4	5			
OT08	1			5			
SS09	1	3	2,4	5			
SS10	1	3	2,4	5			
SS11	1			5			
AOC1				5			
AOC2				5			
AOC3				5			
AOC4				5			
AOC5				5			
AOC6				5			
AOC7				5			
AOC8				5			
AOC9				5			
AOC10				5			

NOTES:
1. Phase I Records Search, Engineering Science 1985
2. Phase II, Stage 1 Confirmation/Quantification Report, Woodward Clyde 1989
3. Stage II Remedial Investigation/Preliminary Feasibility Study, Woodward Clyde 1991
4. Final Site Inspection Report, Woodward Clyde 1993
5. Remedial Investigation/Feasibility Study, Jacobs Engineering, anticipated April 1995

AOC = Area of Concern
IRA = Interim Remedial Action
NFRAP = No Further Response Action Planned
RD/RA = Remedial Design/Remedial Action
RD/RA = Remedial Design/Remedial Action
RI/FS = Remedial Investigation/Feasibility Study
RI/PFS = Remedial Investigation /Preliminary Feasibility Study
SI = Site Inspection

APPENDIX C

DECISION DOCUMENT SUMMARIES

No Decision Documents have been prepared at this time.

APPENDIX D

"NO FURTHER RESPONSE ACTION PLANNED" SUMMARIES

No NFRAP Documents have been prepard at this time.


LOWER
CAMP
MINER ROAD


SD07
ROAD/RUNWAY OILING
SS11
SPILL/LE
LF05

INDIAN RIVER

SS09
WASTE ACCUMULATION
AREA NO. 3
SPILL/LEAK NOS. 4 & 11

MOG
STA

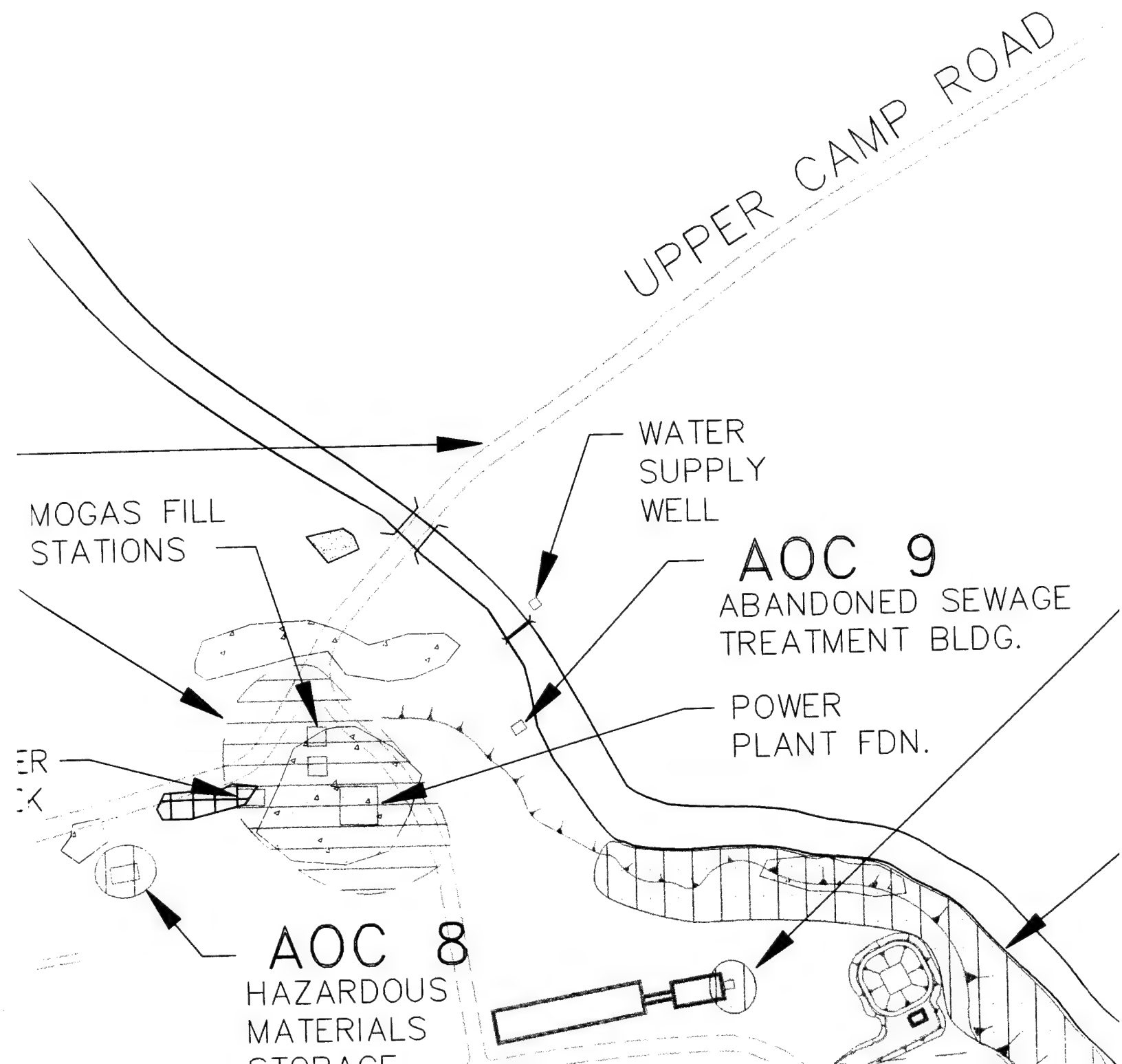
1

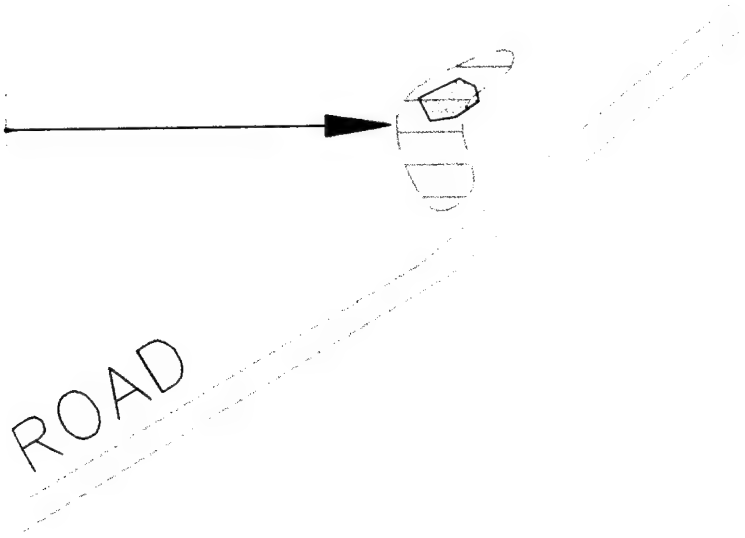
'LEAK NOS. 1, 3 & 8

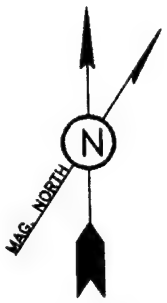
PCB POWER
POLE RACK

MOGAS
TANK

SS03
WASTE ACCUMULATION
AREA NO. 5







MAGNETIC DECLINATION : 24° 42'
ANNUAL RATE OF CHANGE : 4.1'
U.S.G.S. EPOCH 1985

N 74,000

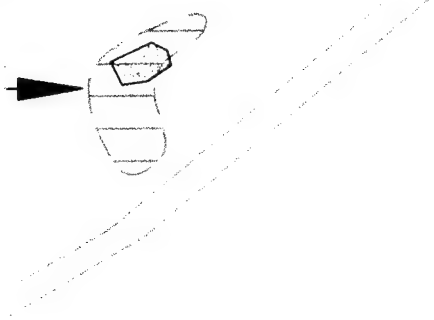
SEWAGE
BLDG.

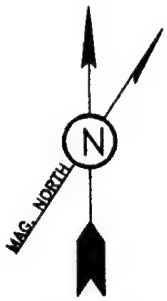
AOC 10
OIL/WATER
SEPARATOR
HOLDING TANK

AOC 7
EAST
RUNWAY
DUMP

LEGEND

- BUILDINGS
- GRAVEL ROADS
- RIVER, STREAM, OR CREEK
- ESCARPMENT
- CULVERT
- APPROXIMATE WASTE ACCUMULATION AREA LOCATION
- APPROXIMATE LANDFILL LOCATION AREA
- APPROXIMATE AREA OF CONCERN LOCATION
- UNEVALUATED AREAS
- CONTAMINATION ABOVE ACTION LEVELS
- CONTAMINATION BELOW ACTION LEVELS
- AREA OF NO SUSPECTED CONTAMINATION





MAGNETIC DECLINATION : 24° 42'
ANNUAL RATE OF CHANGE : 4.1'
U.S.G.S. EPOCH 1985

N 74,000

AOC 10
OIL/WATER
SEPARATOR
HOLDING TANK

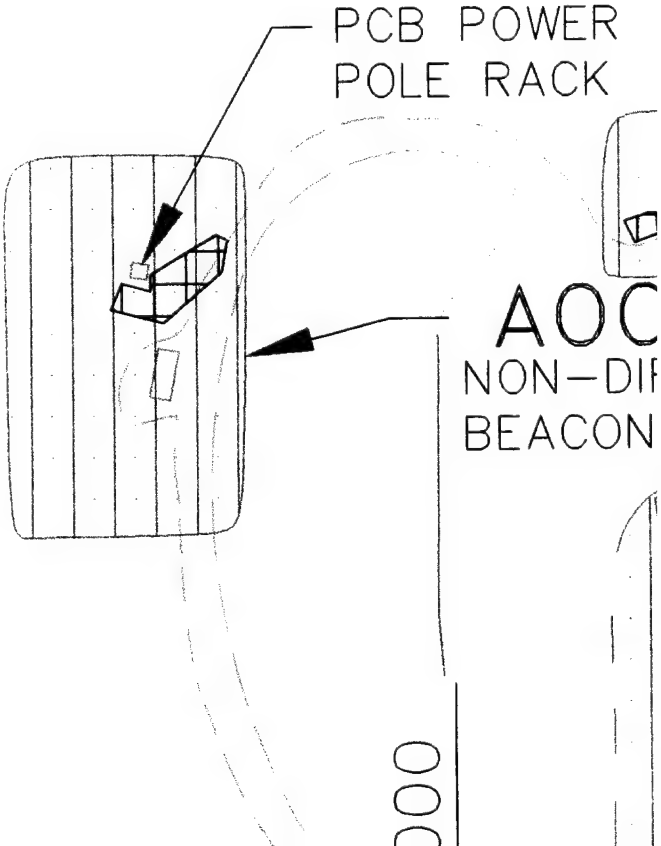
AOC 7
EAST
RUNWAY
DUMP

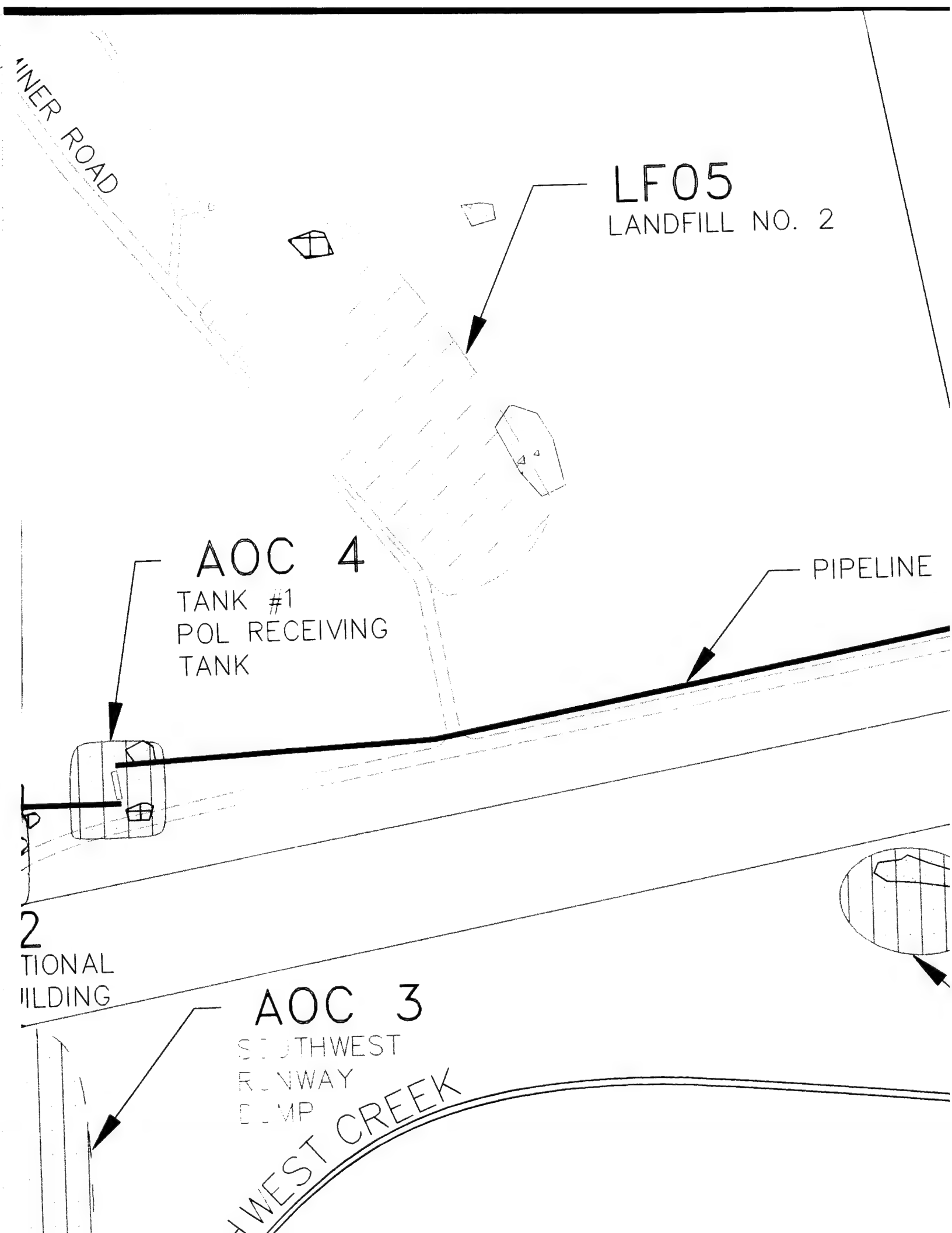
LEGEND

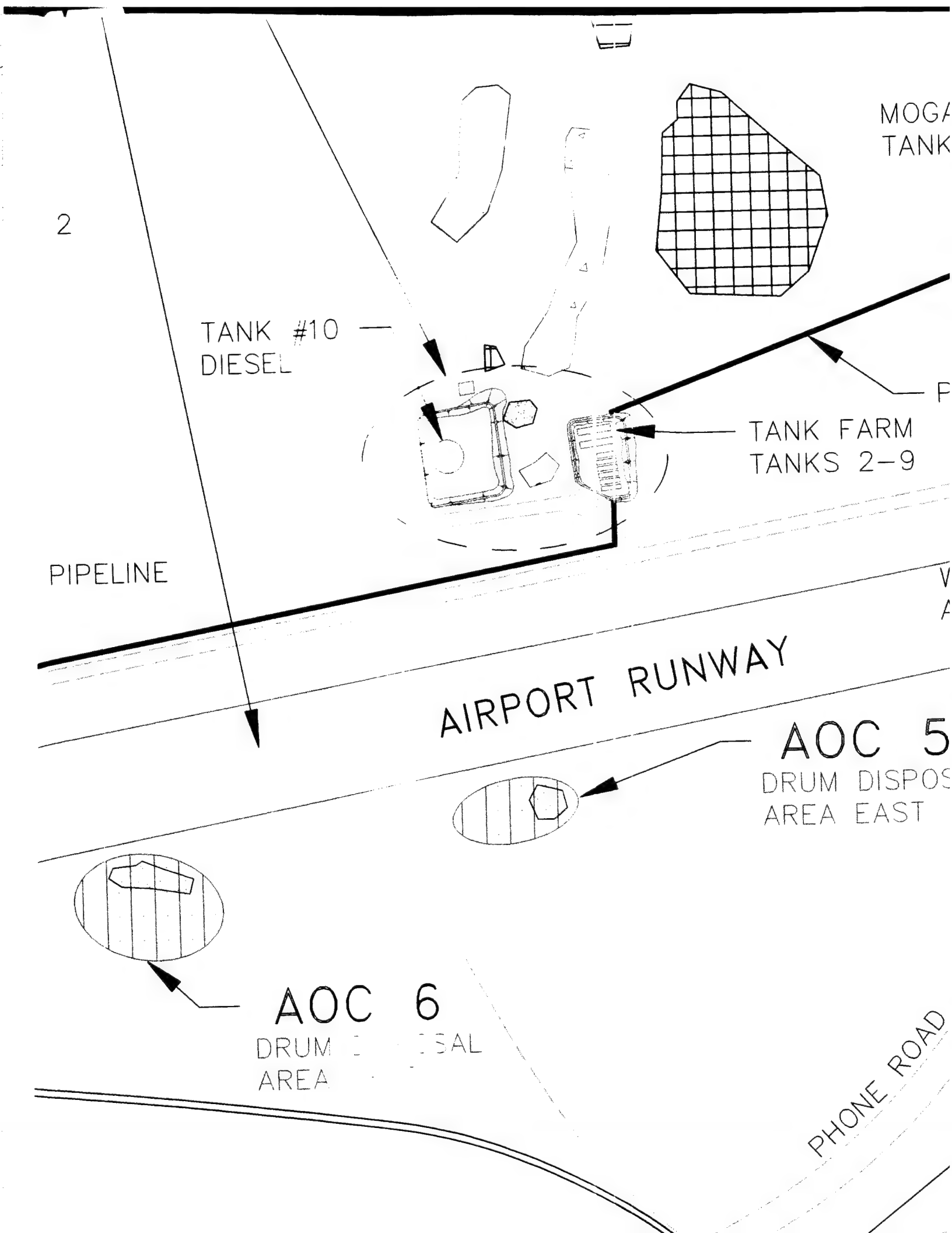
- BUILDINGS
- GRAVEL ROADS
- RIVER, STREAM, OR CREEK
- ESCARPMENT
- CULVERT
- APPROXIMATE WASTE ACCUMULATION AREA LOCATION
- APPROXIMATE LANDFILL LOCATION AREA
- APPROXIMATE AREA OF CONCERN LOCATION
- UNEVALUATED AREAS
- CONTAMINATION ABOVE ACTION LEVELS
- CONTAMINATION BELOW ACTION LEVELS
- AREA OF NO SUSPECTED CONTAMINATION

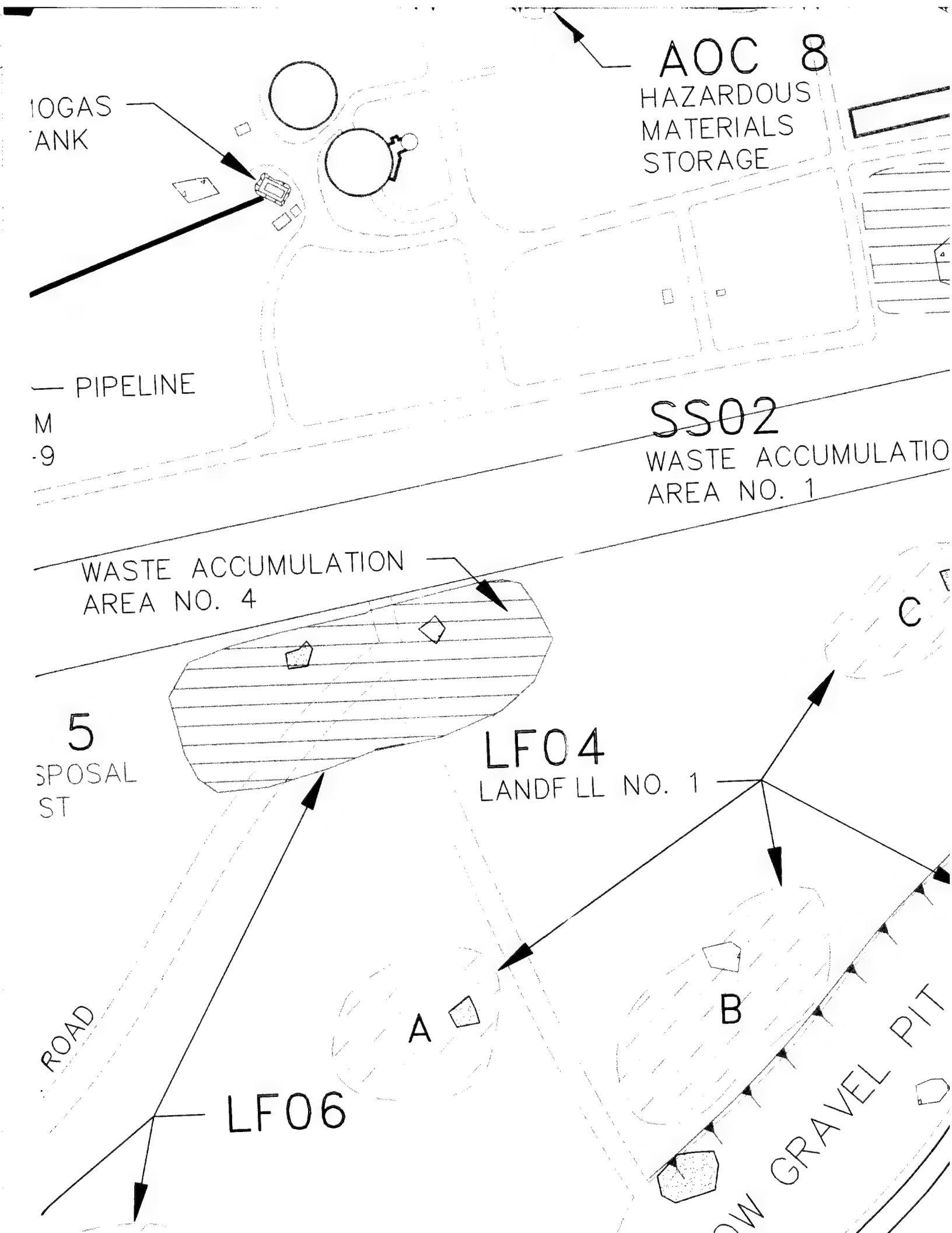
AOC 1

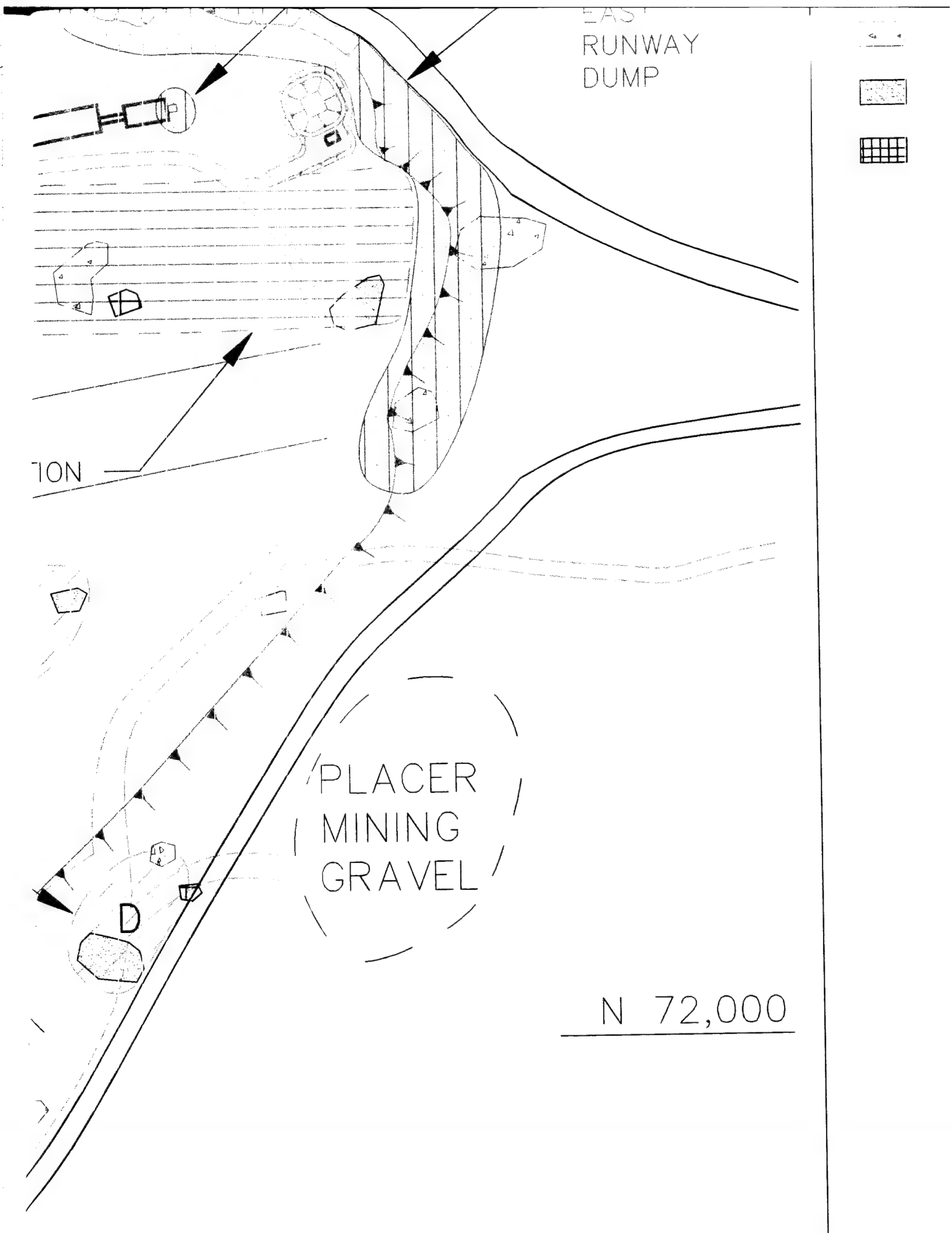
AERO–POL
OFF–LOADING
PUMP

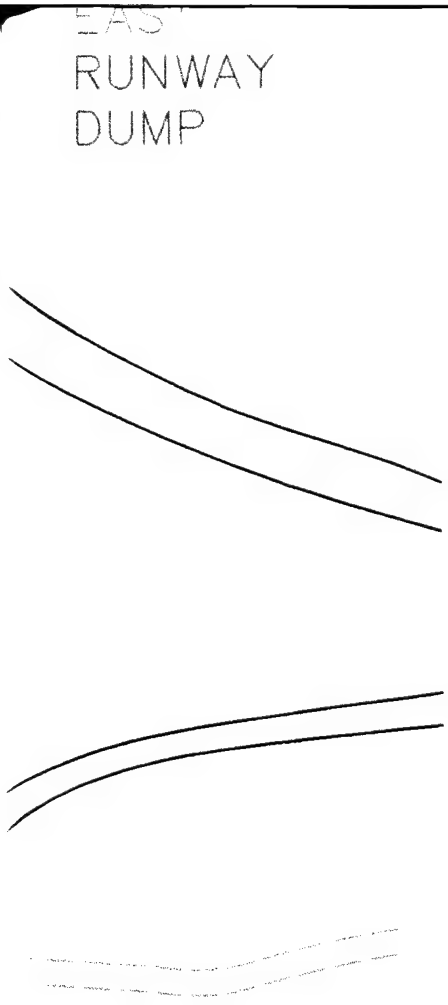



INER ROAD
LF05
LANDFILL NO. 2
AOC 4
TANK #1
POL RECEIVING
TANK
PIPELINE
2
TIONAL
ILDING
AOC 3
SOUTHWEST
RUNWAY
DUMP
WEST CREEK


MOGA
TANK
2
TANK #10
DIESEL
TANK FARM
TANKS 2-9
PIPELINE
AIRPORT RUNWAY
AOC 5
DRUM DISPOS
AREA EAST
AOC 6
DRUM
AREA
PHONE ROAD


AOC 8
HAZARDOUS
MATERIALS
STORAGE
IOGAS
ANK
— PIPELINE
M
-9
SS02
WASTE ACCUMULATIO
AREA NO. 1
WASTE ACCUMULATION
AREA NO. 4
5
SPOSAL
ST
LF04
LANDFILL NO. 1
C
A
B
ROAD
LF06
GRAVEL PIT

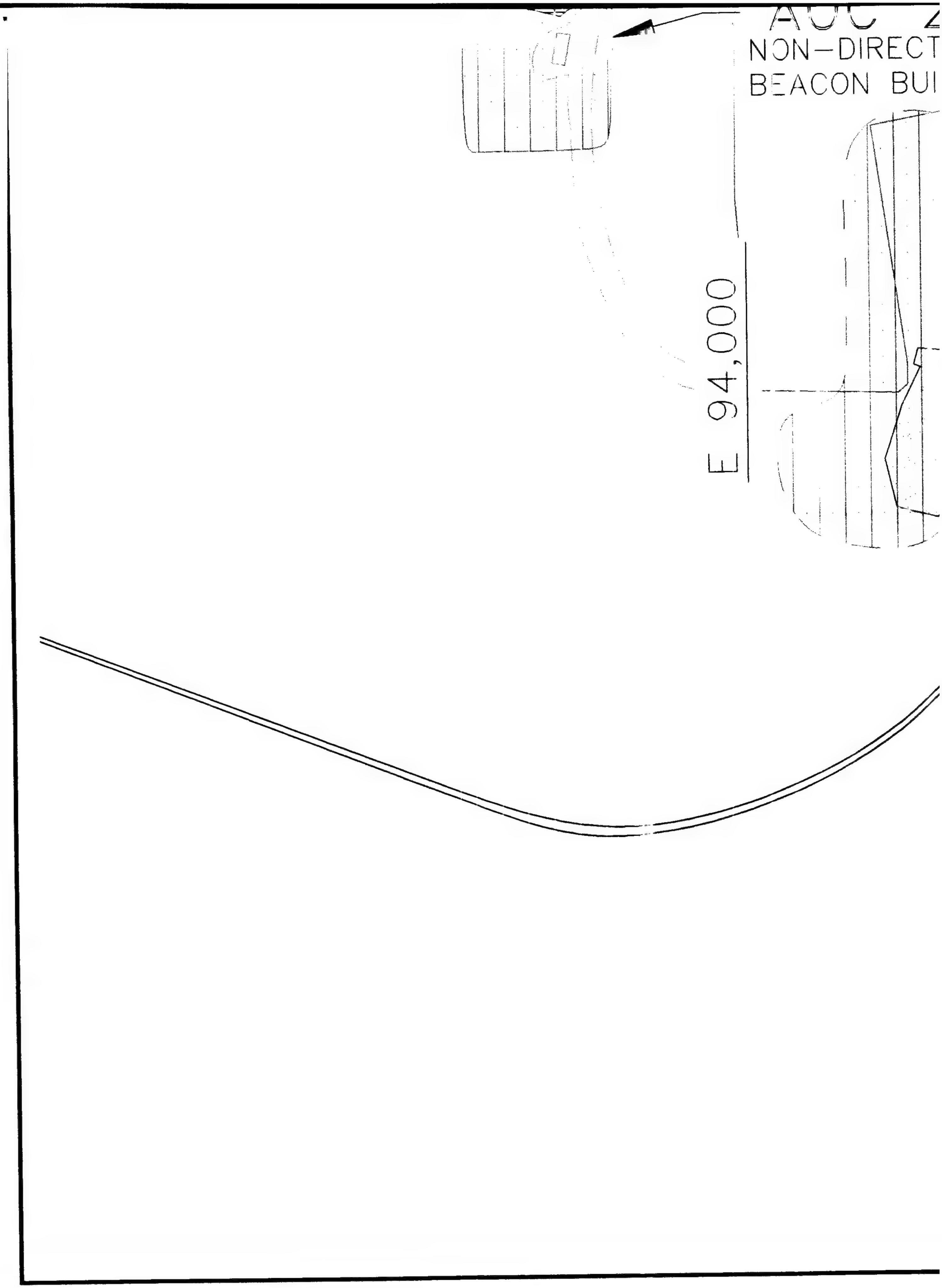

EAST
RUNWAY
DUMP
TION
PLACER
MINING
GRAVEL
D
N 72,000

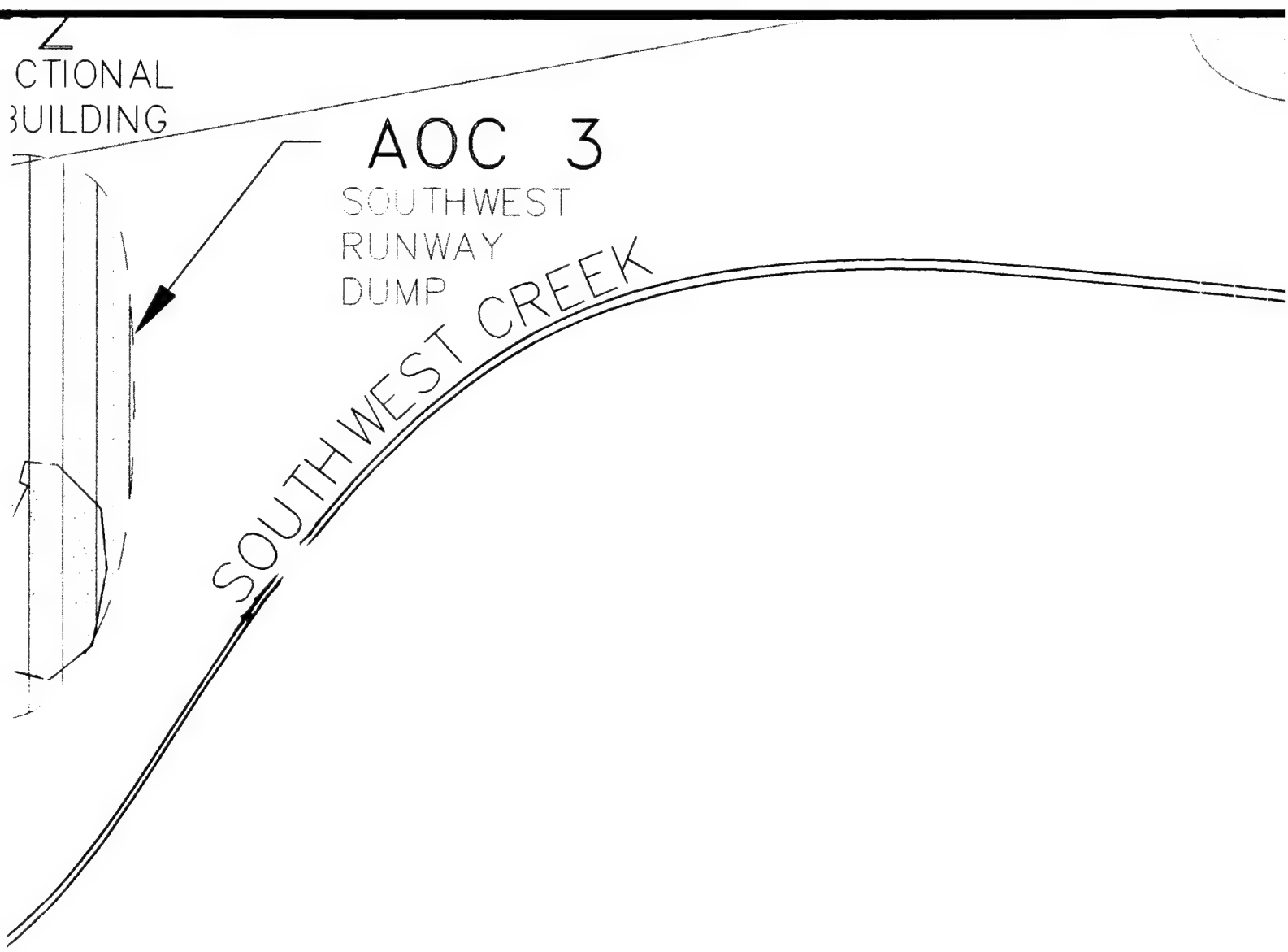


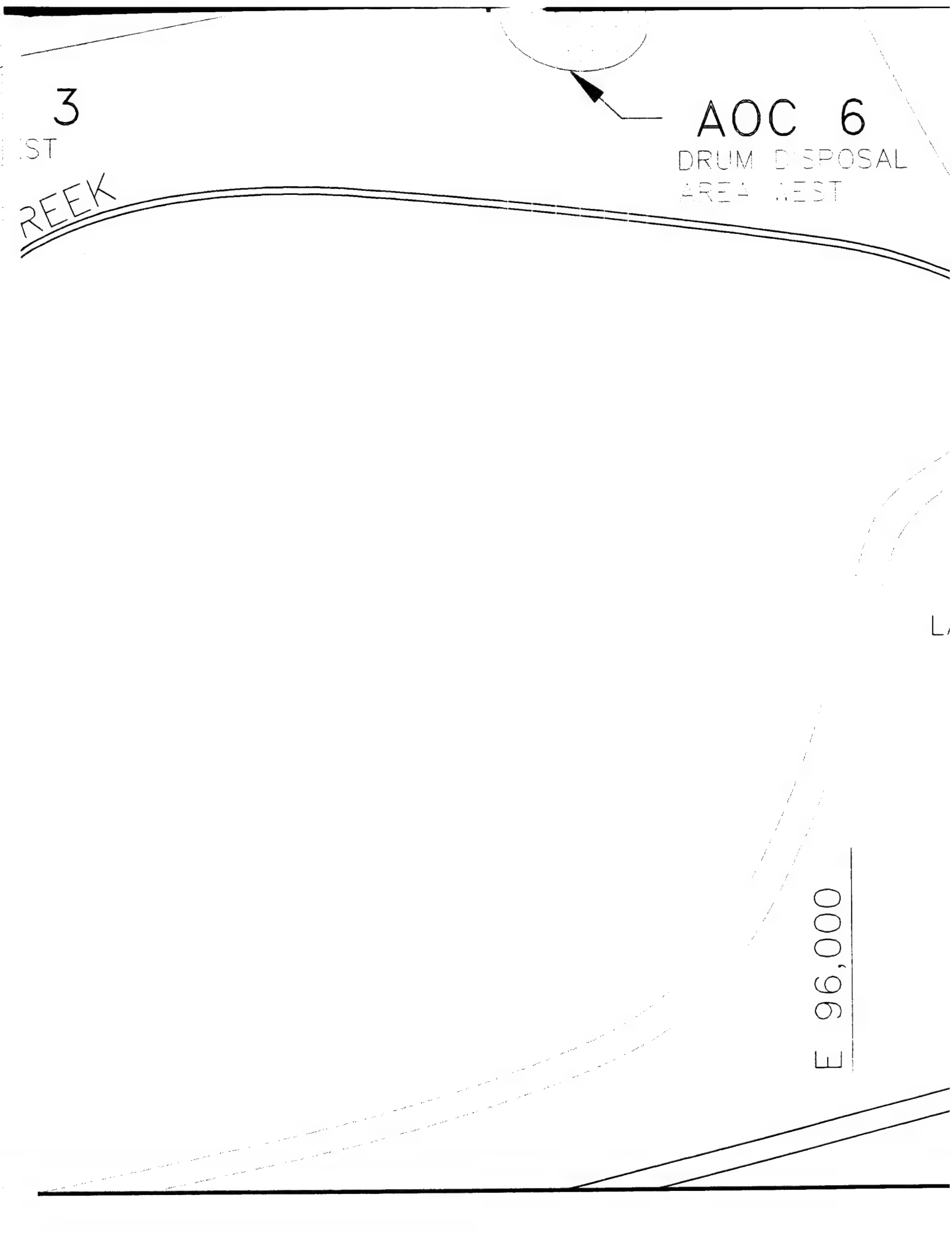
CONTAMINATION ABOVE ACTION LEVELS

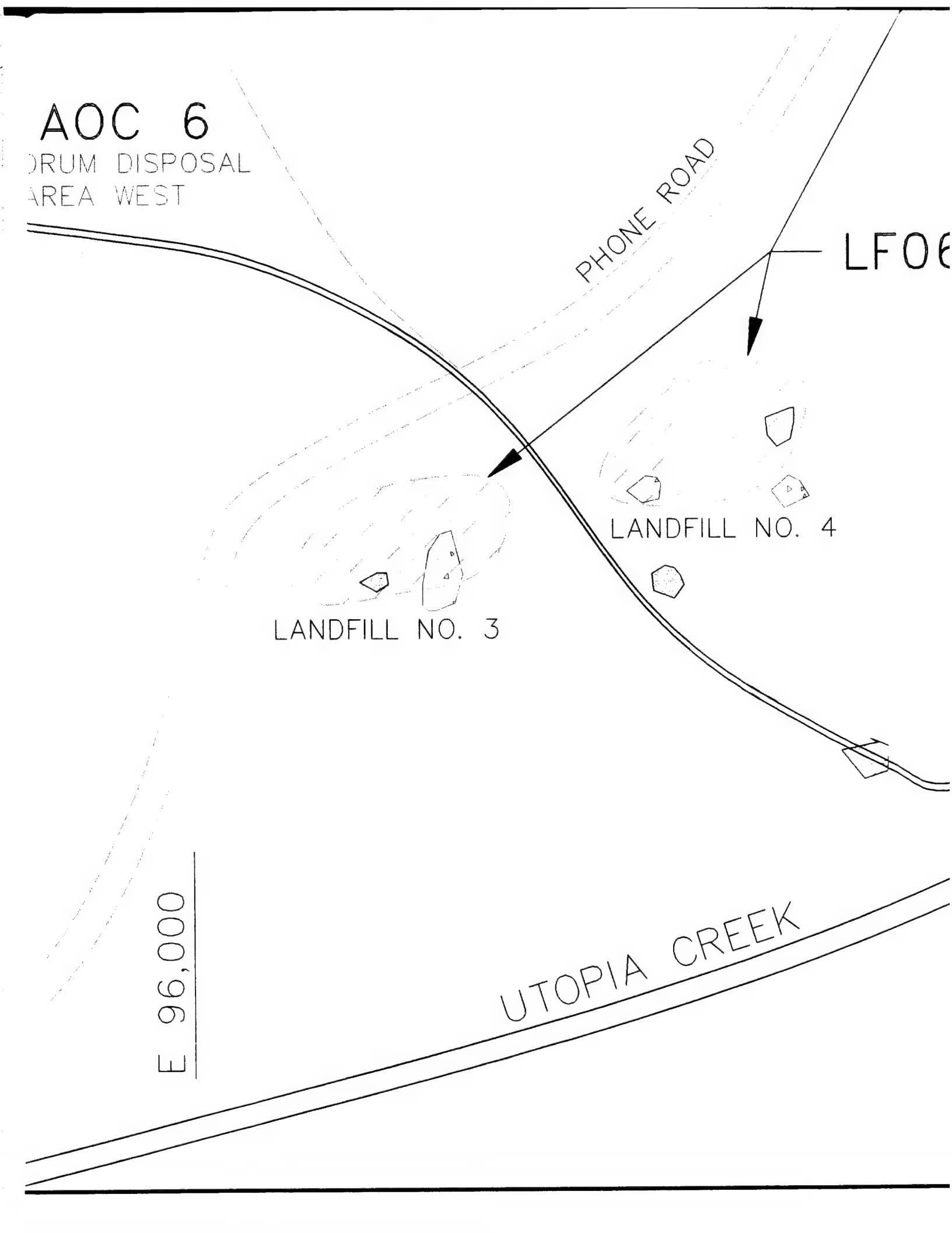
CONTAMINATION BELOW ACTION LEVELS

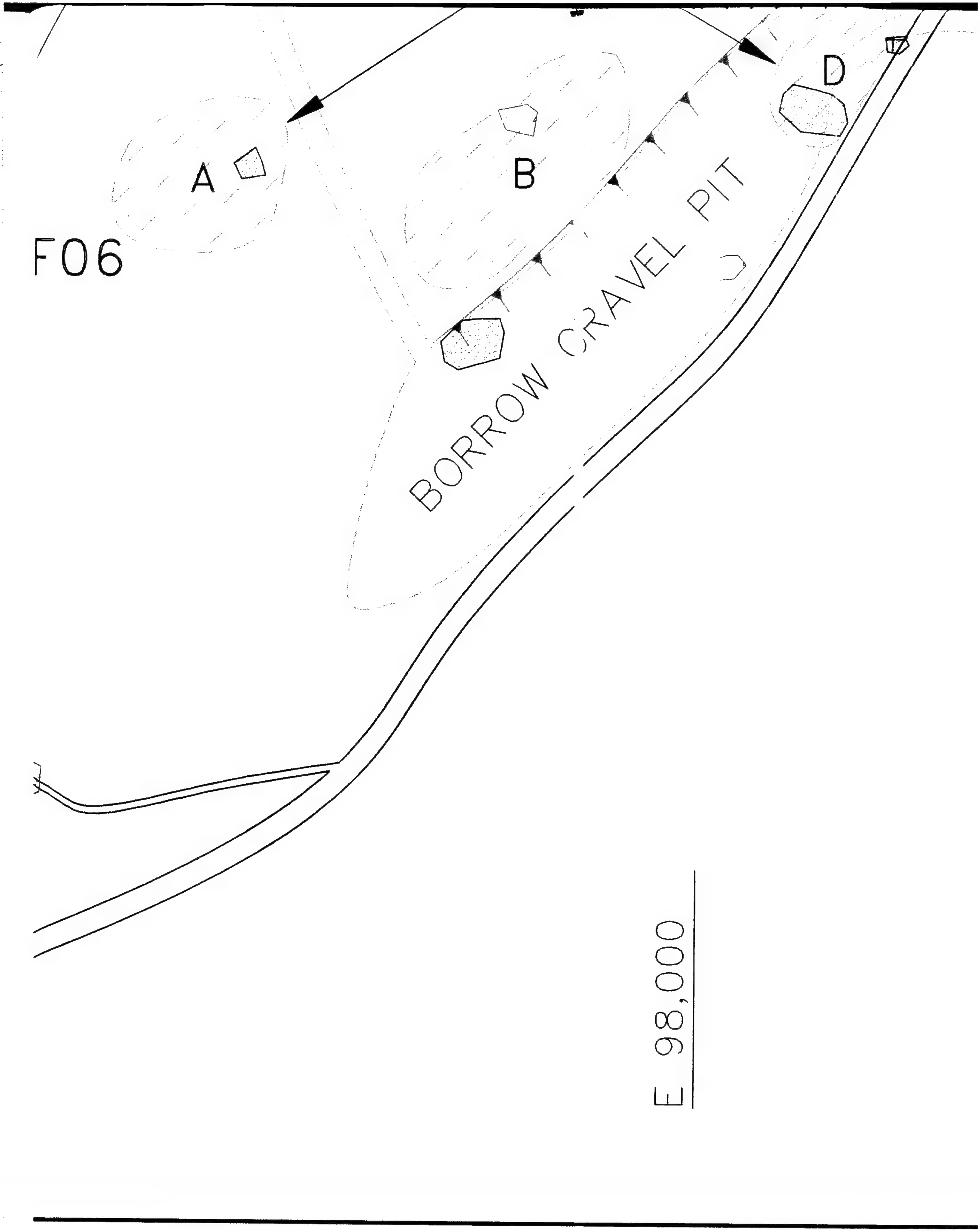
AREA OF NO SUSPECTED CONTAMINATION

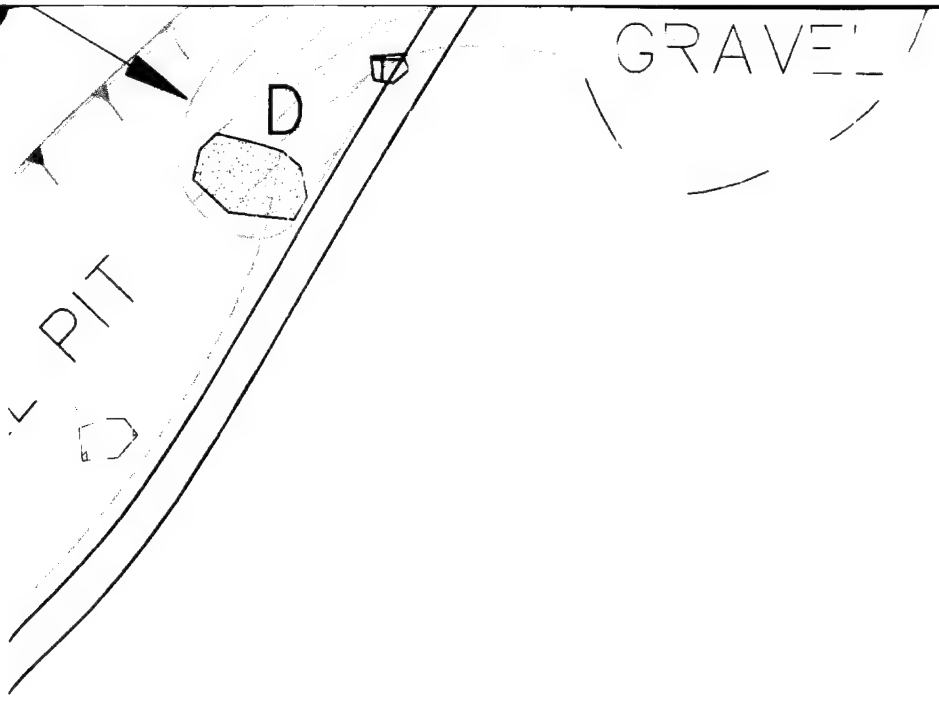

NON-DIRECT
BEACON BUI
E 94,000


CTIONAL
BUILDING
AOC 3
SOUTHWEST
RUNWAY
DUMP
SOUTHWEST CREEK


3
ST
REEK
AOC 6
DRUM DISPOSAL
AREA WEST
L
E 96,000


AOC 6
)RUM DISPOSAL
AREA WEST
PHONE ROAD
LF06
LANDFILL NO. 4
LANDFILL NO. 3
E 96,000
UTOPIA CREEK


A
B
D
F06
BORROW GRAVEL PIT
E 98,000



N 72,000

L 90,000

PROJ. M
R.HE
DRAWN
RLB

1 72,000

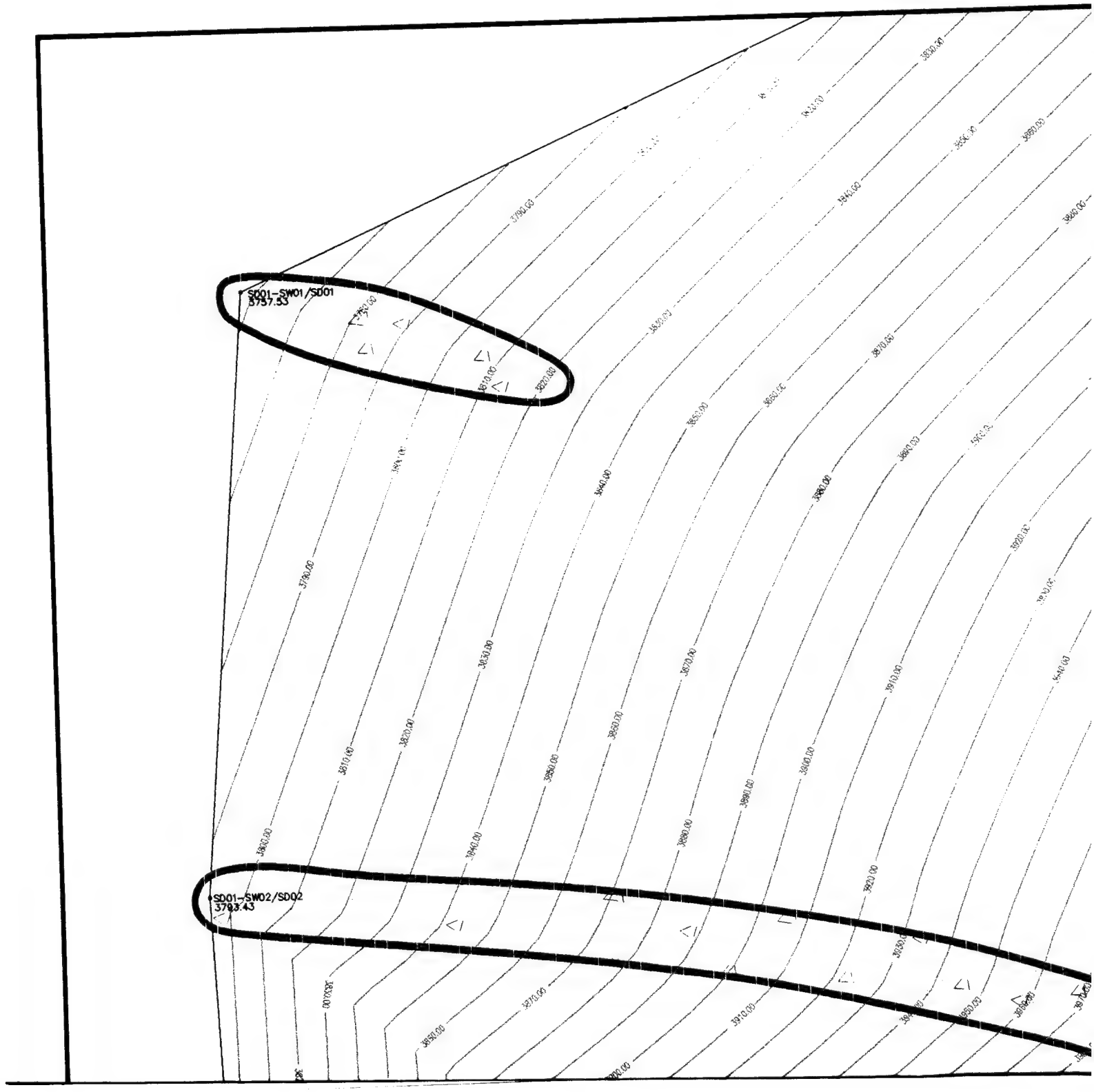
0 50 100 200

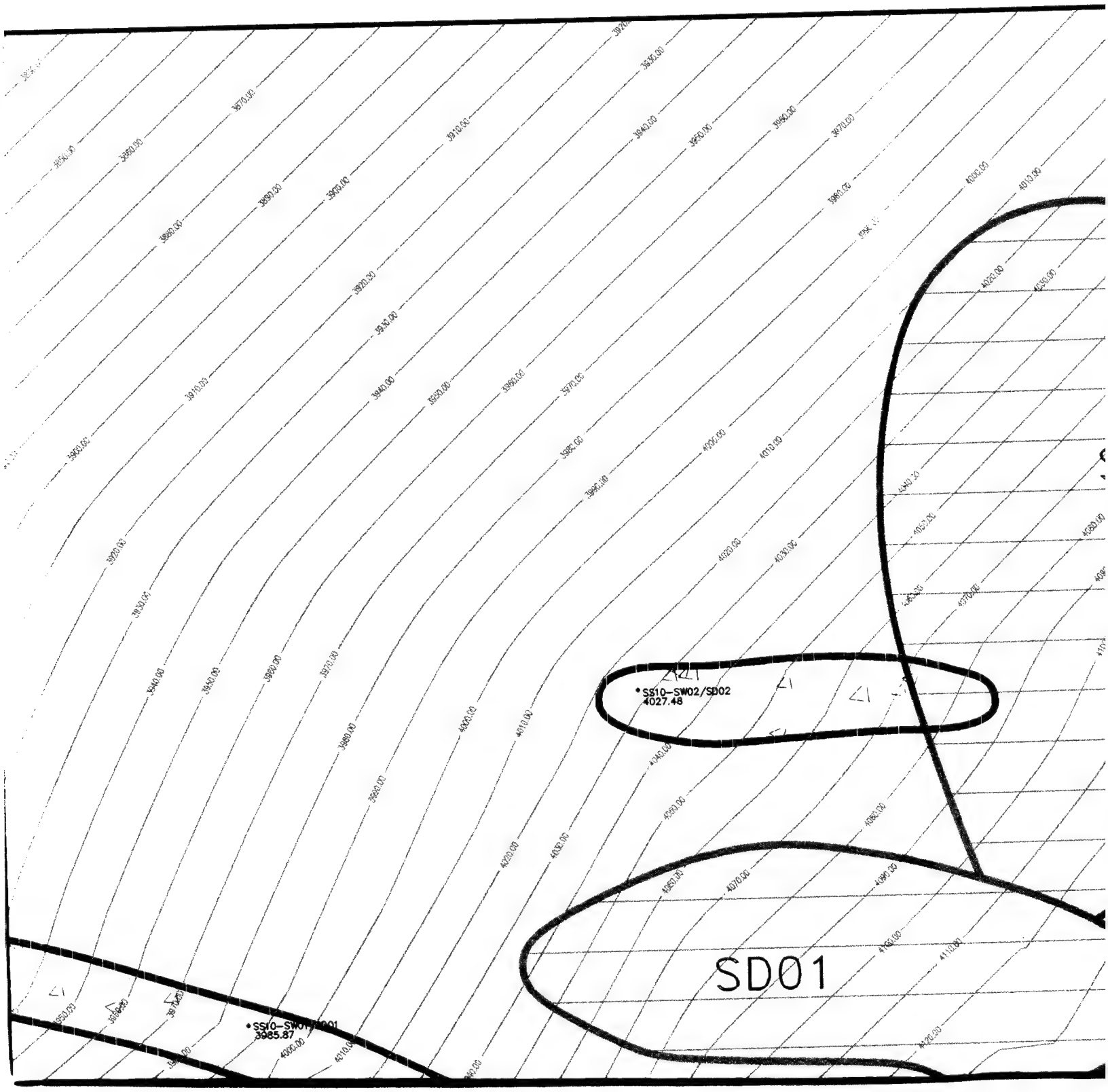
SCALE IN FEET

INDIAN MOUNTAIN
LONG RANGE RADAR STATION

ENVIRONMENTAL CONDITION
OF PROPERTY
LOWER CAMP

PROJ. MGR.	ACAD FILE NO.	FIGURE NO.
R.HENRY	PLATE1	PLATE 1
DRAWN BY	PROJ. NO.	DATE
RLB	05-G-46200	2/13/95


SD01-SW01/SD01
3757.53
SD01-SW02/SD02
3793.43


SS10-SW02/SD02
4027.48
SD01
SS10-SW01/SD01
3985.87


SD01
SS10 SPILL/LEAK NO.
FORMER 200,000 GALL
POL TANKS
SS10-TP13
41.1.96


SD01-SW02/SD02
3793.43
3810.00
3820.00
3830.00
3840.00
3850.00
3930.00
3940.00
3950.00
3960.00
3970.00
3980.00
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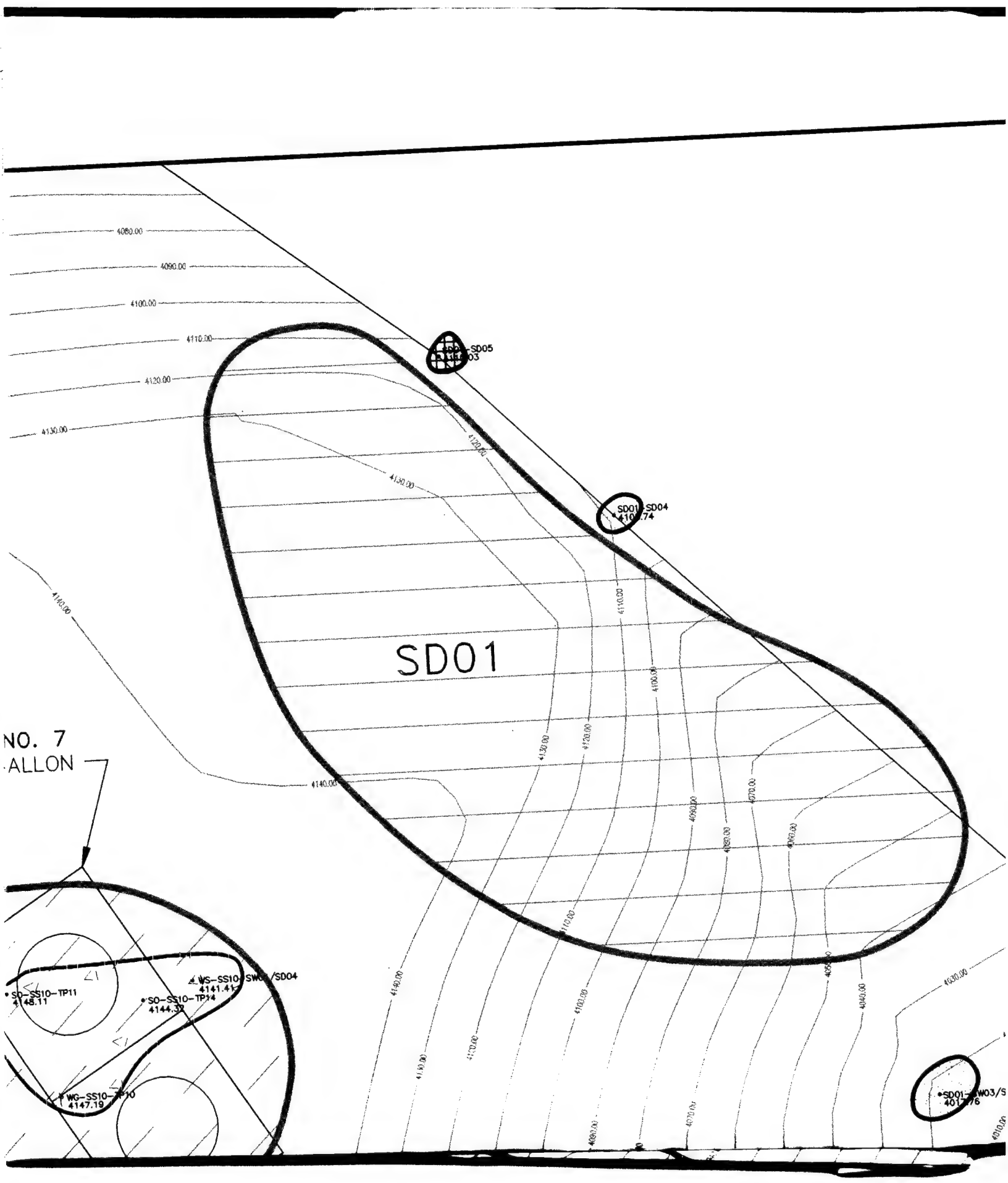
4040.00
4050.00
4060.00
4070.00
4080.00


SD01
SD05
SD04
NO. 7
ALLON
SO-SS10-TP11
4148.11
SO-SS10-TP14
4144.32
WG-SS10-TP10
4147.19
4080.00
4090.00
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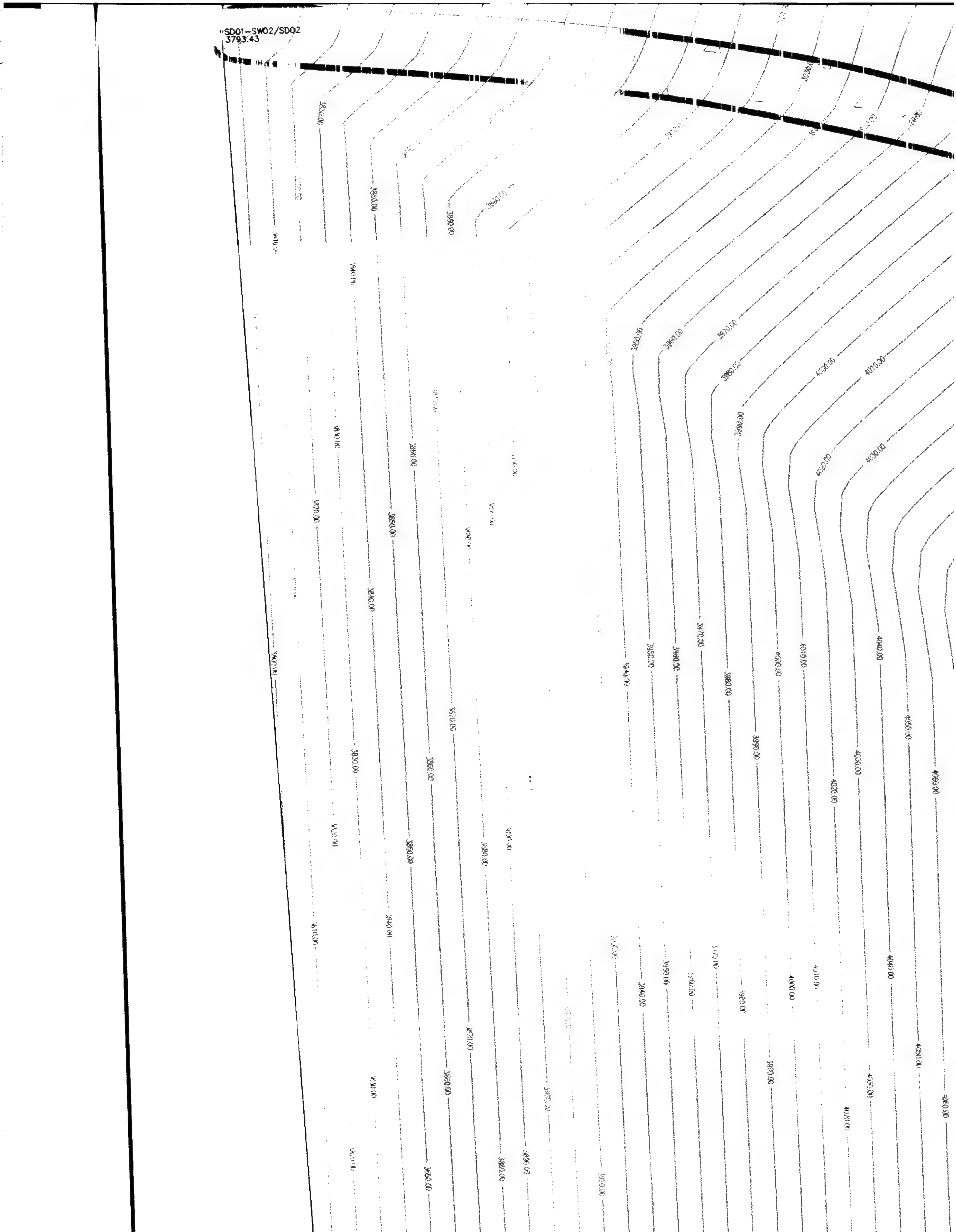
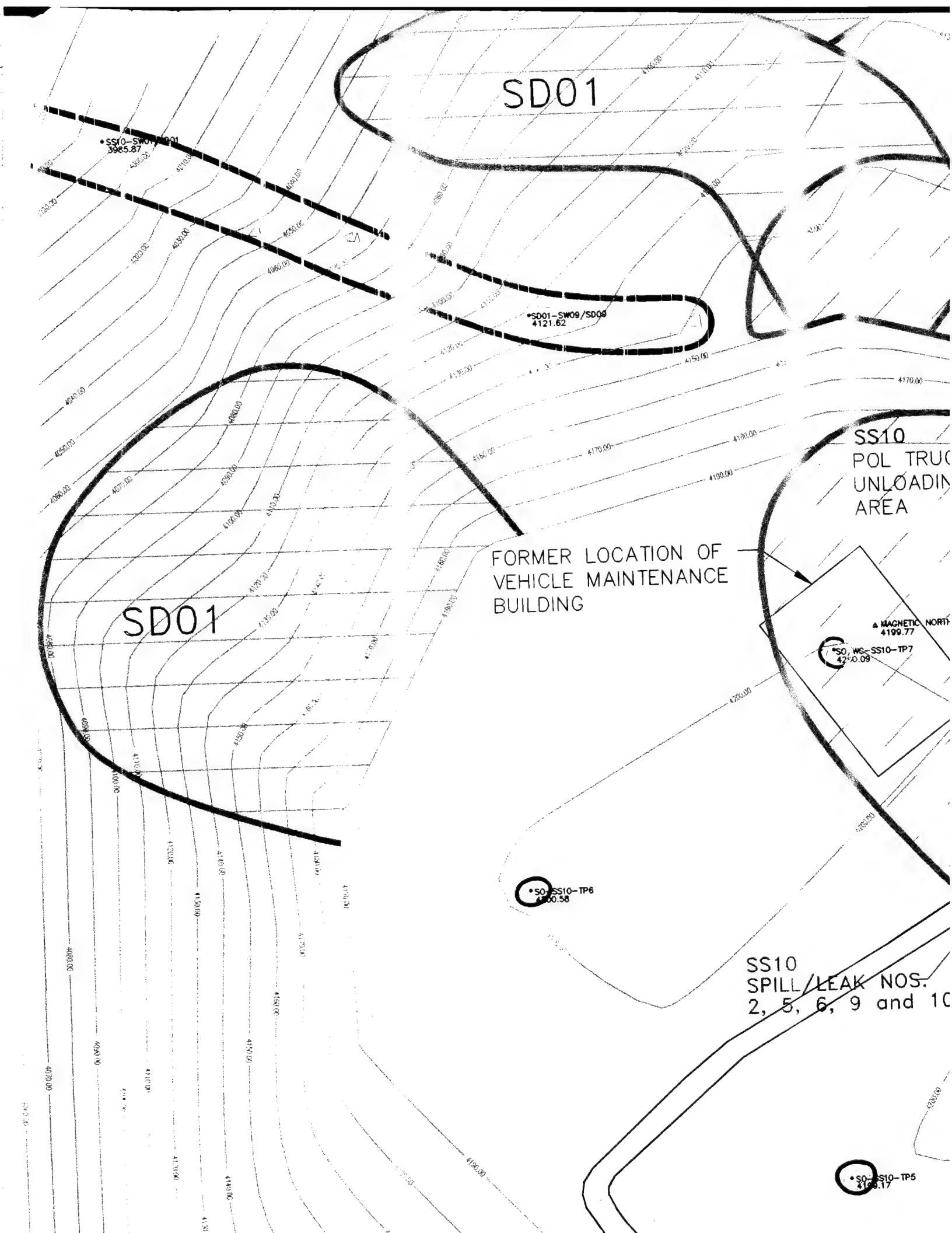
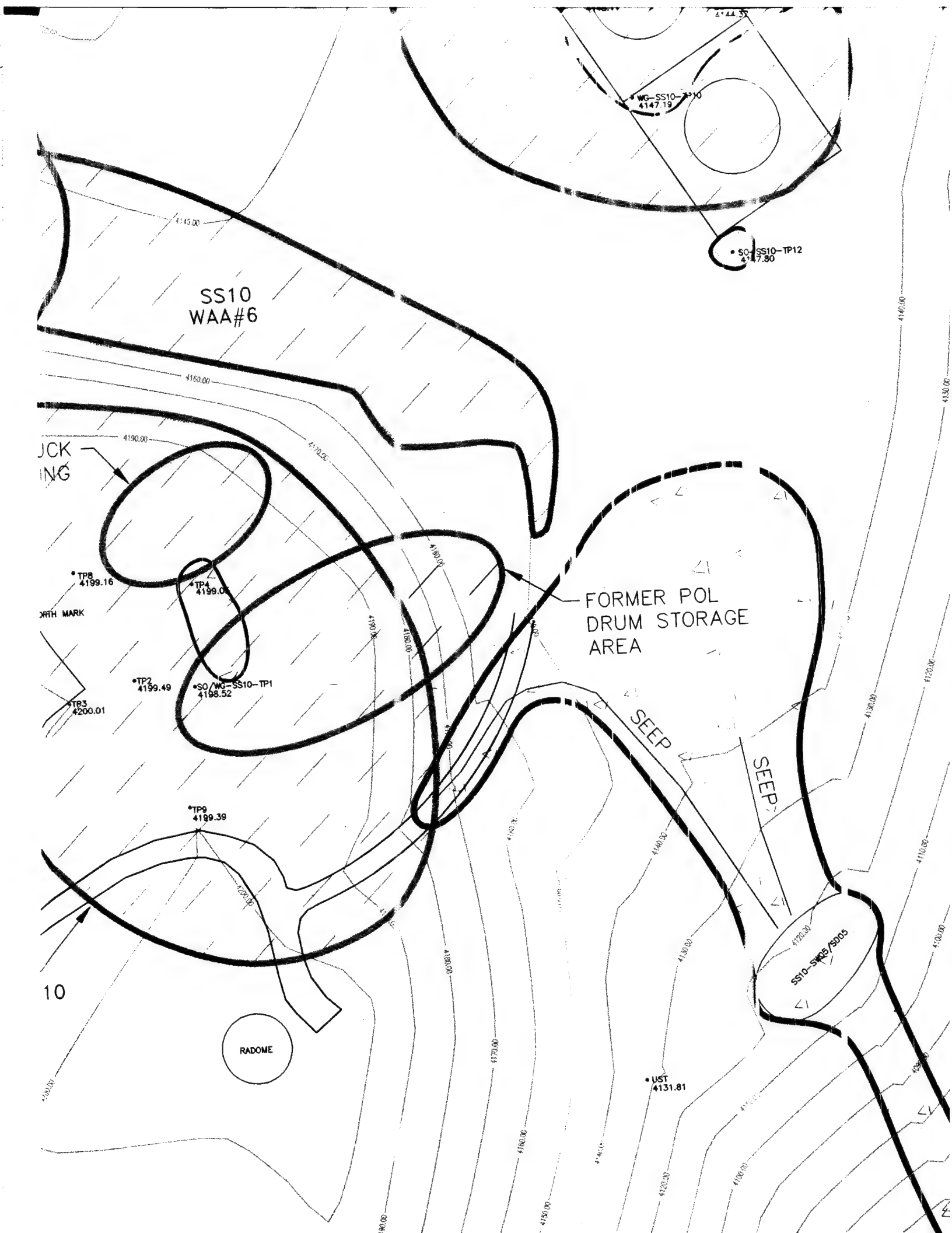
4110.00
4120.00
4130.00
4140.00
4150.00


SD01-SW02/SD02
3793.43


SD01
SD01
SS10
POL TRUC
UNLOADIN
AREA
FORMER LOCATION OF
VEHICLE MAINTENANCE
BUILDING
SS10
SPILL/LEAK NOS.
2, 5, 6, 9 and 10
SD01-SW09/SD08
4121.62
MAGNETIC NORTH
4199.77
SO, WG-SS10-TP7
SO-SS10-TP6
SO-SS10-TP5


SS10
WAA#6
FORMER POL
DRUM STORAGE
AREA
SEEP
SEEP
RADOME
SS10-SW05/SD05
WG-SS10-TP10
4147.19
SO-SS10-TP12
4147.80
TP8
4199.16
TP4
4199.0
TP2
4199.49
SO/WG-SS10-TP1
4198.52
TP3
4200.01
TP9
4199.39
UST
4131.81
4145.00
4160.00
4190.00
4170.00
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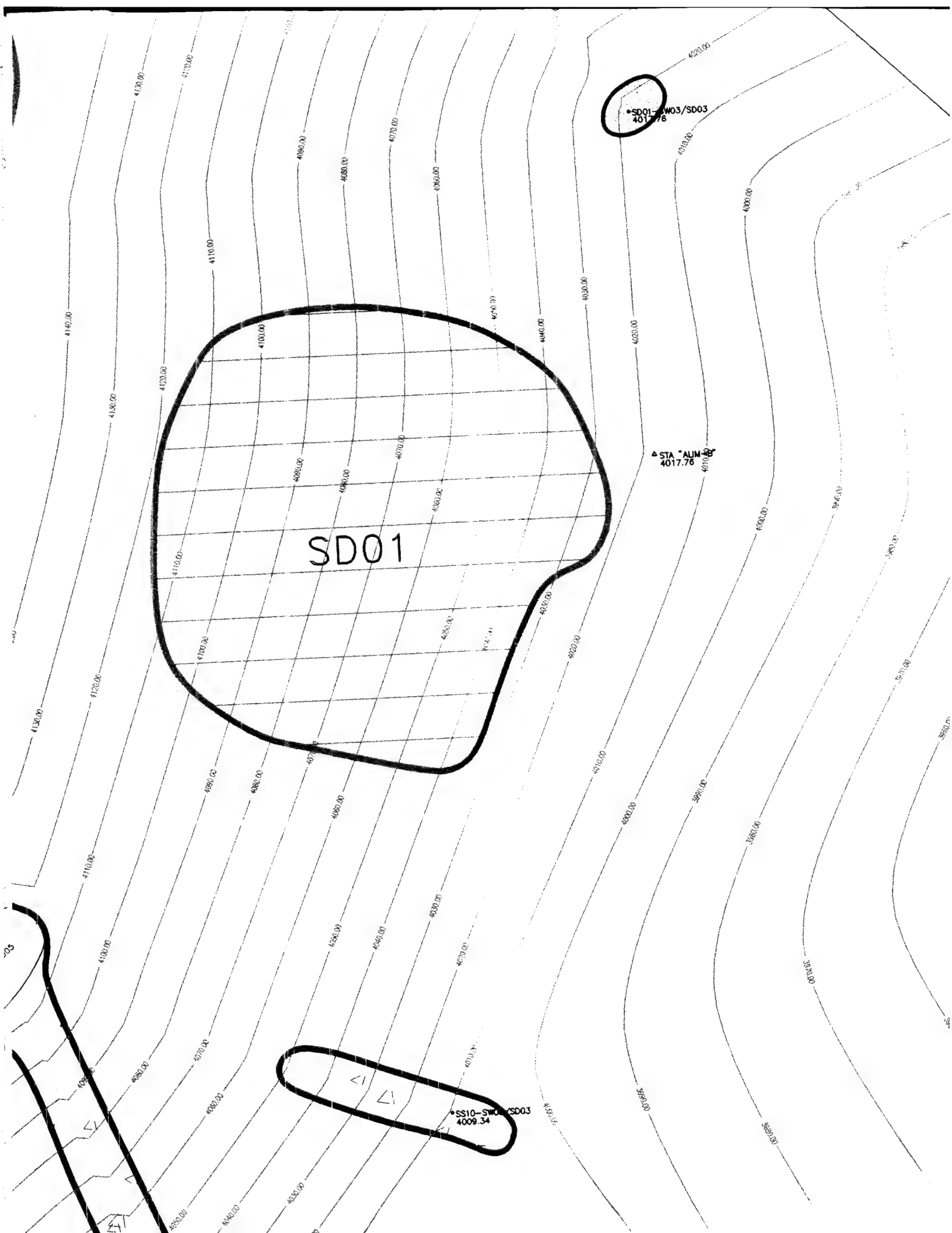
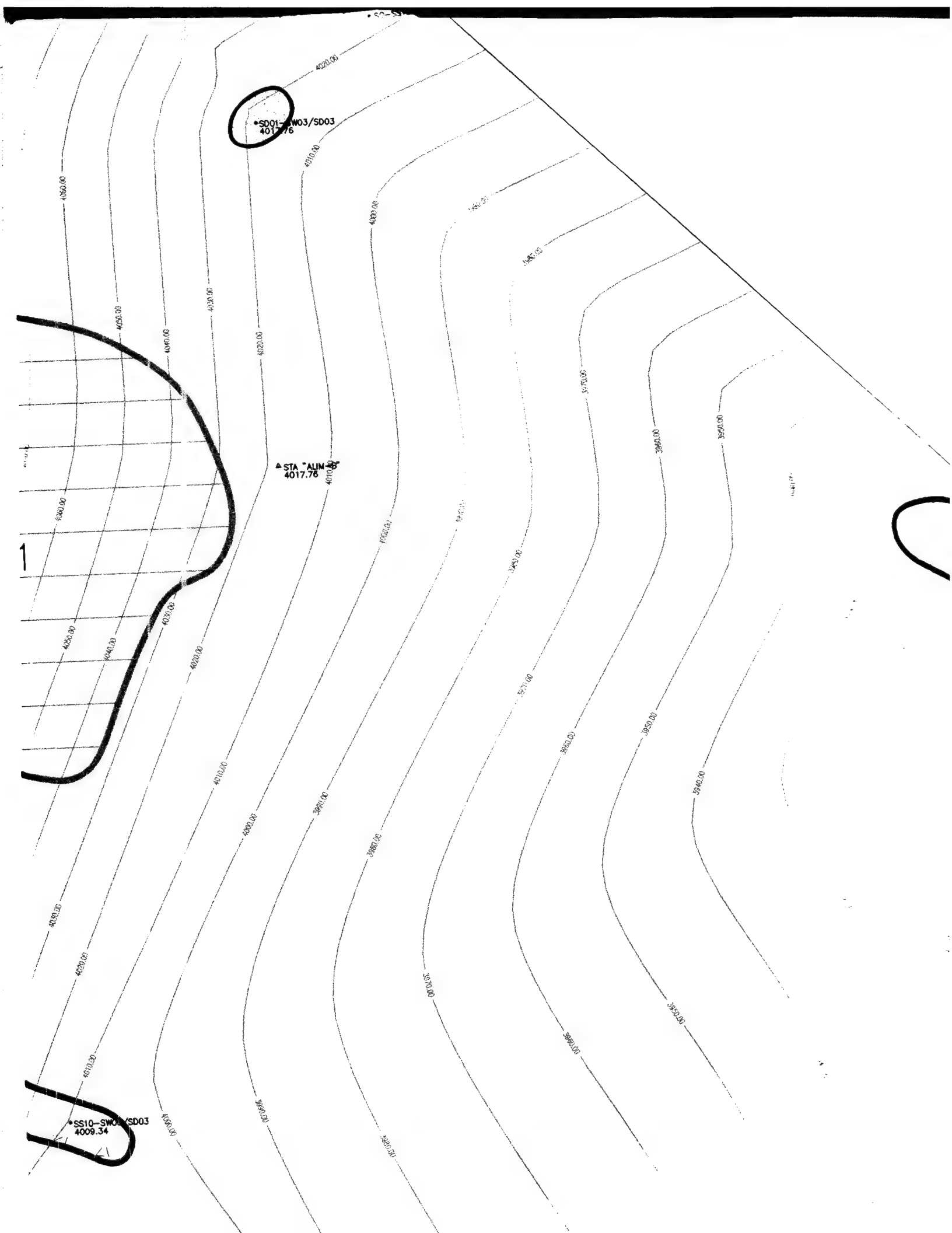

SD01
SD01-SW03/SD03
4017.76
STA "ALUM-2B"
4017.76
SS10-SW04/SD03
4009.34


SD01-SW03/SD03
4017.76
STA "ALUM"
4017.76
SS10-SW03/SD03
4009.34
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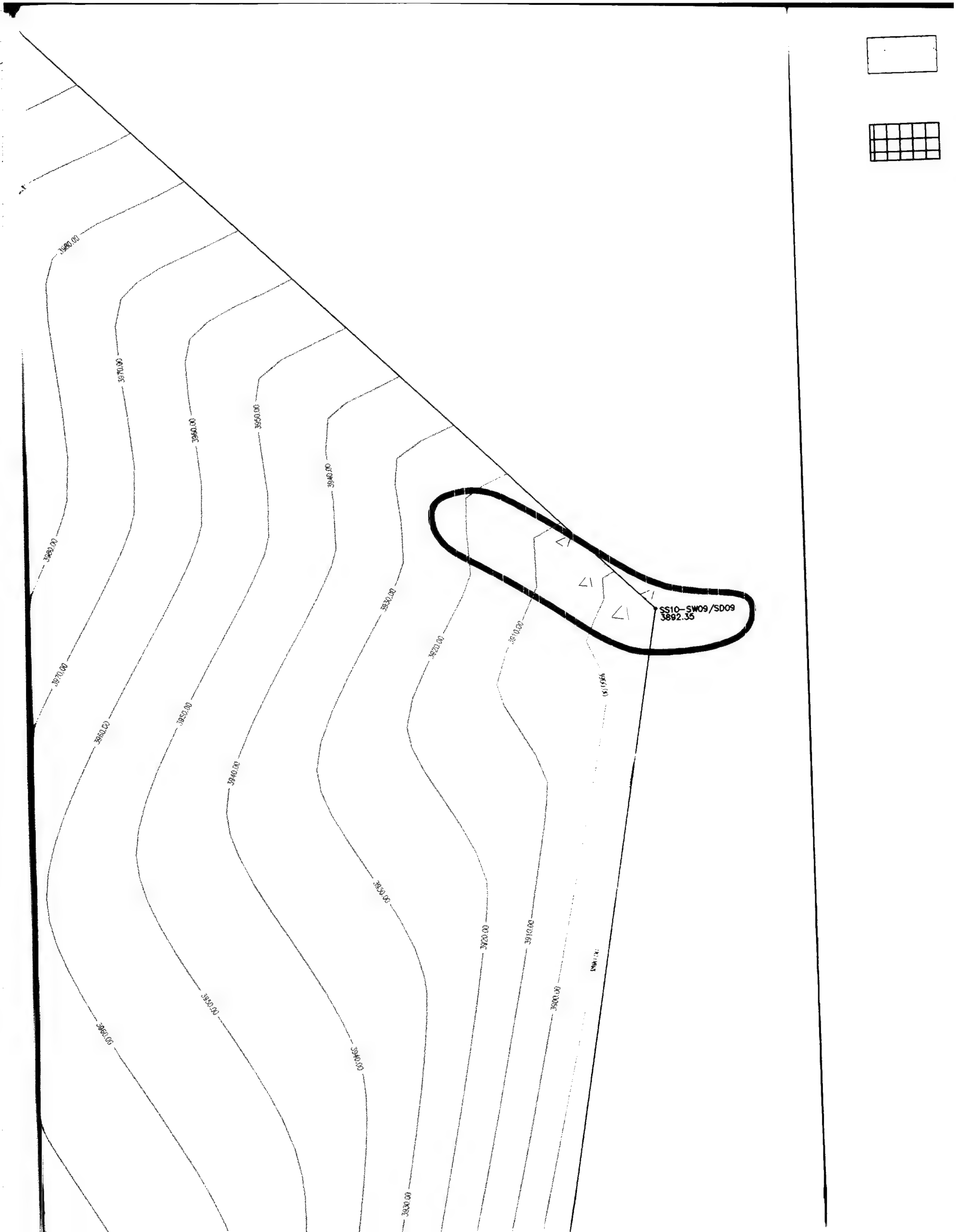
4060.00


SS10-SW09/SD09
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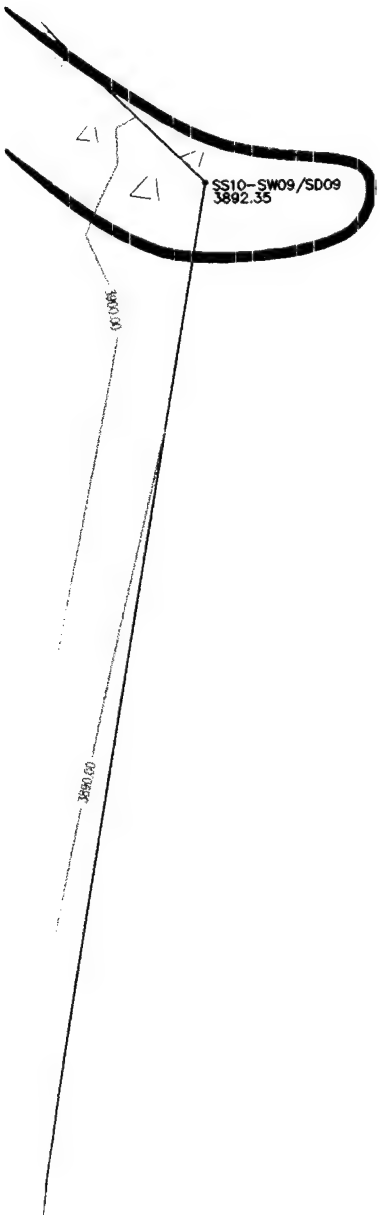
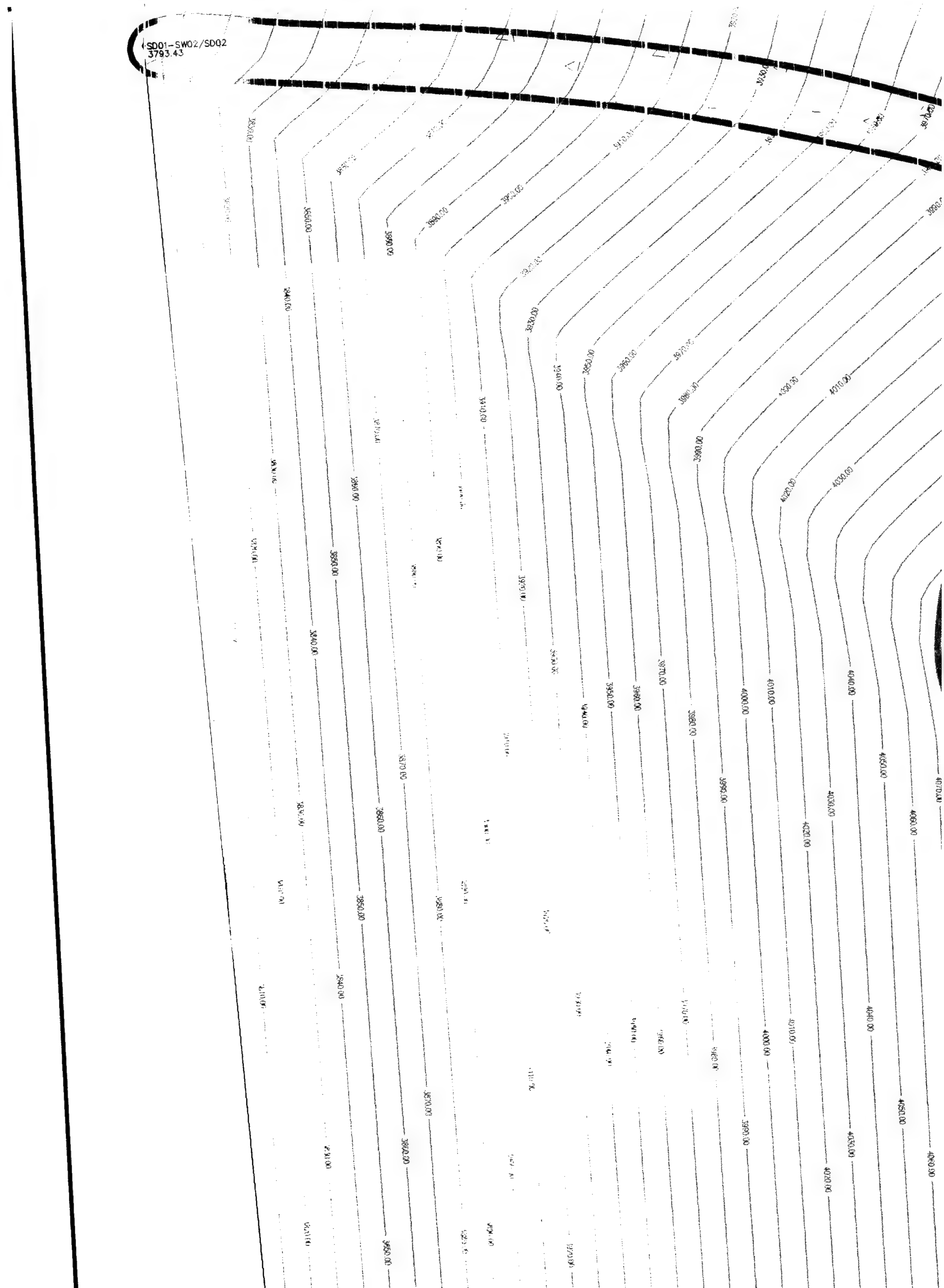
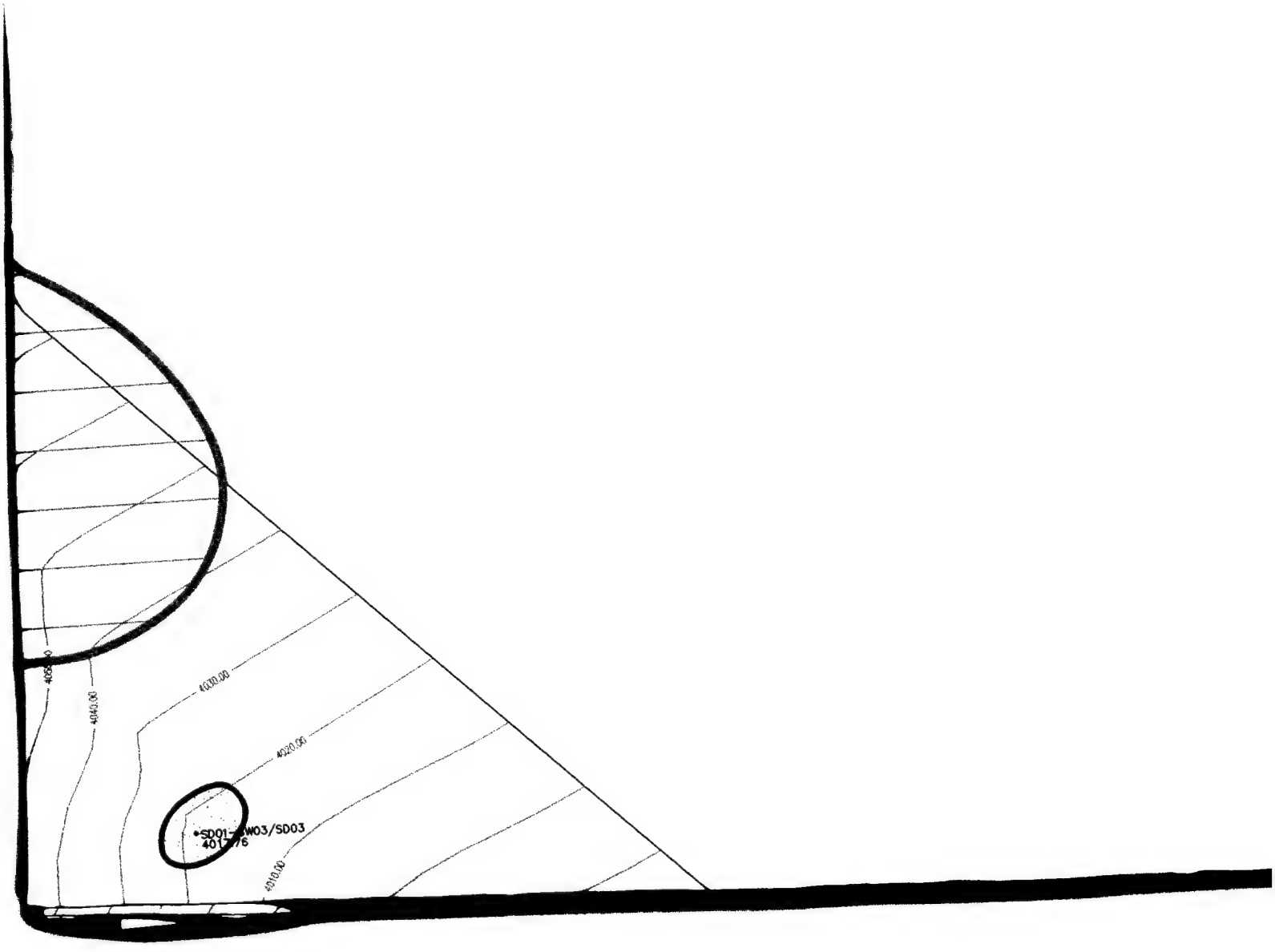
3960.00
3950.00
3940.00
3930.00
3920.00
3910.00
3900.00

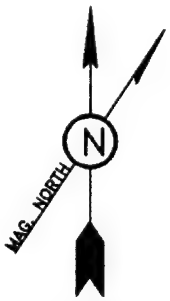
CONTAMINATION BELOW ACTION LEVELS

AREA OF NO SUSPECTED CONTAMINATION




SD01-SW02/SD02
3793.43


4060.00
4040.00
4030.00
4020.00
4010.00
•SD01-MW03/SD03
401.76

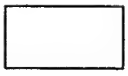


MAGNETIC DECLINATION : 24° 42'
ANNUAL RATE OF CHANGE : 4.1'
U.S.G.S. EPOCH 1985

LEGEND

DUMP AREAS

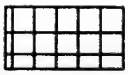
WASTE ACCUMULATION AND FUEL RELEASE AREAS



UNEVALUATED AREAS

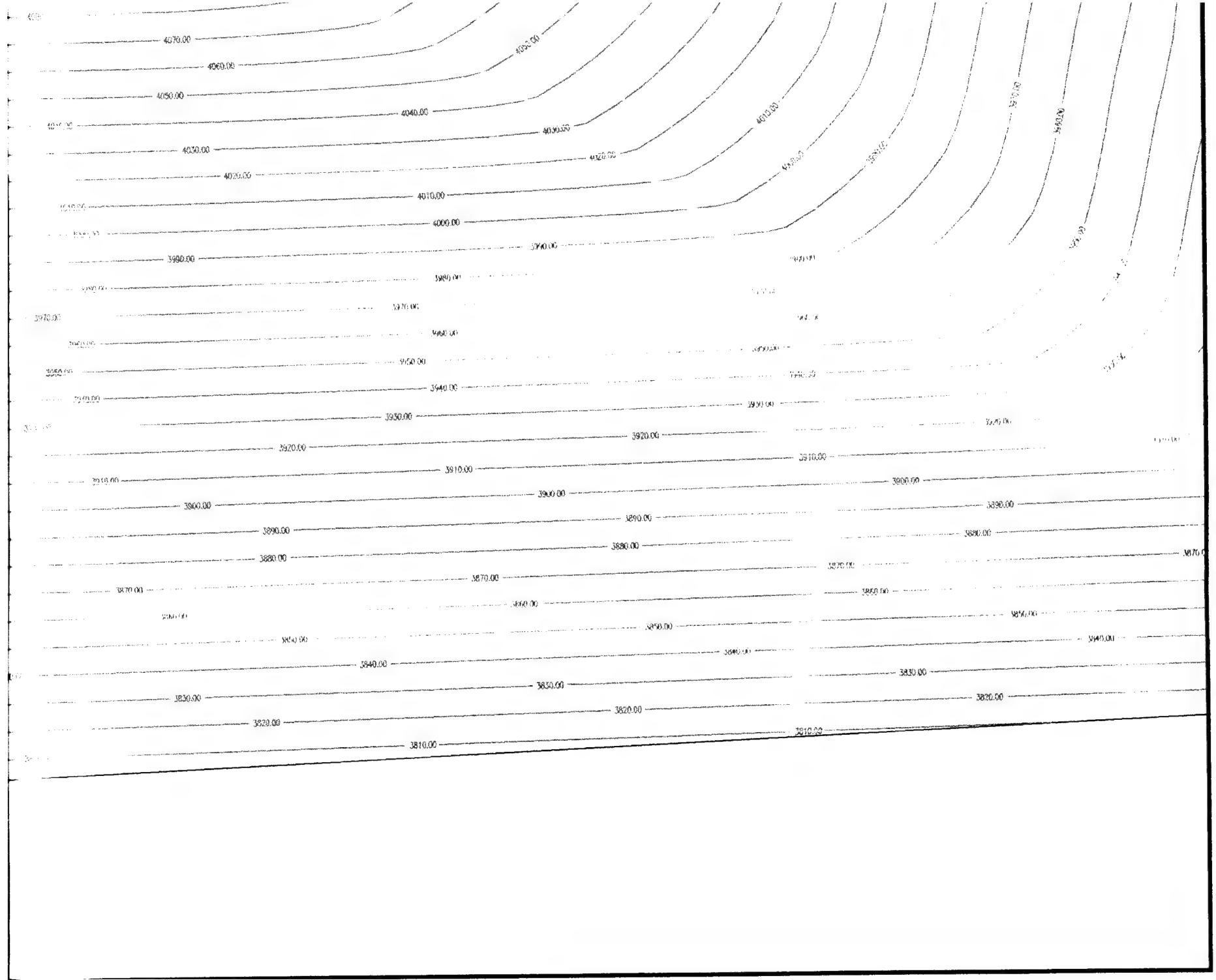
CONTAMINATION ABOVE ACTION LEVELS

CONTAMINATION BELOW ACTION LEVELS



AREA OF NO SUSPECTED CONTAMINATION


AOC 3
SOUTHWEST
RUNWAY
DUMP
SOUTHWEST CREEK


4070.00
4060.00
4050.00
4040.00
4030.00
4020.00
4010.00
4000.00
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3960.00
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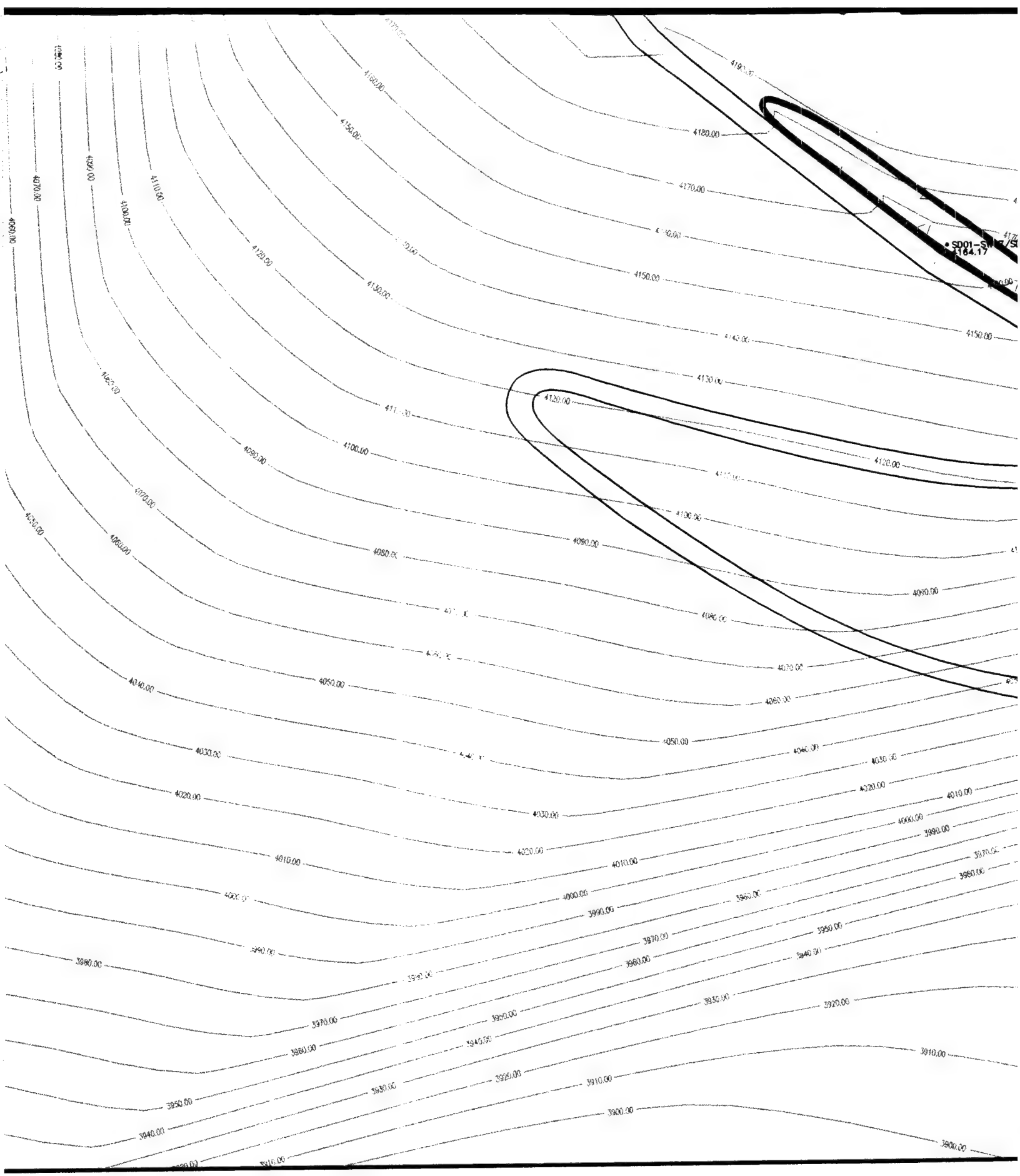
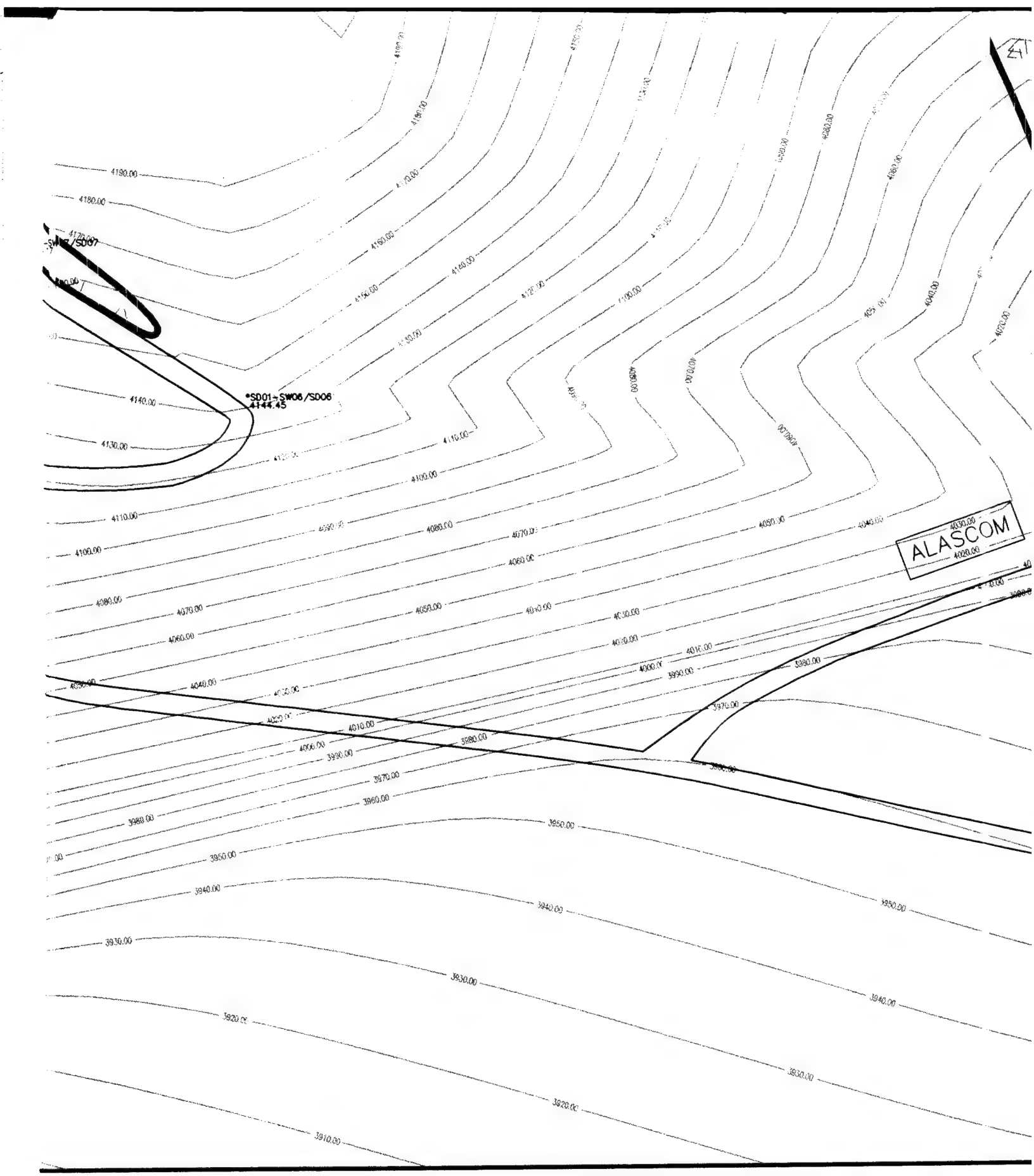
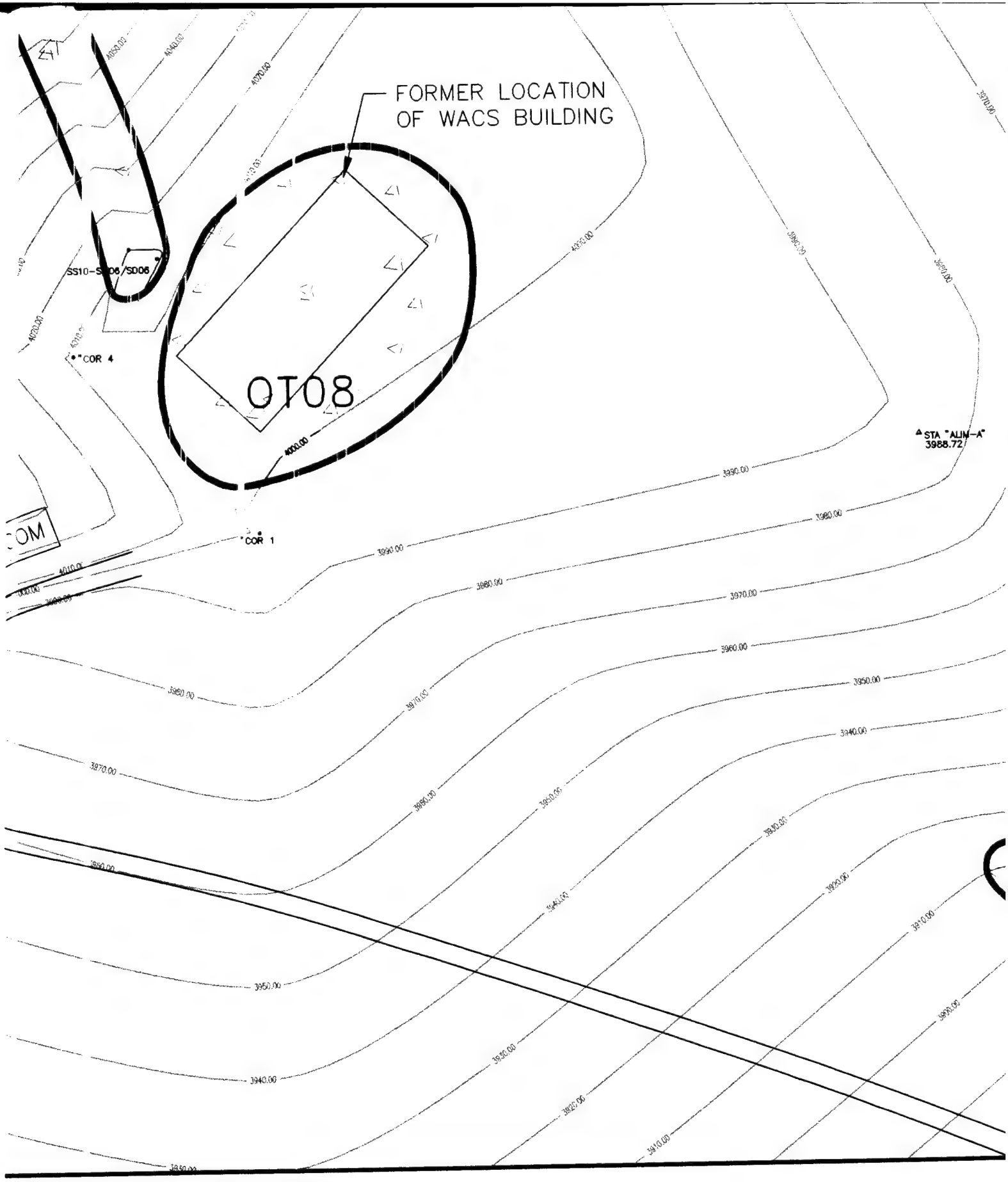
3810.00


SD01-SWB/SL
4164.17


•SD01 - SW06 /SD06
4144.45
ALASCOM


FORMER LOCATION
OF WACS BUILDING
OT08
SS10-SD06/SD06
COR 4
COR 1
STA "ALIM-A"
3988.72
4000.00
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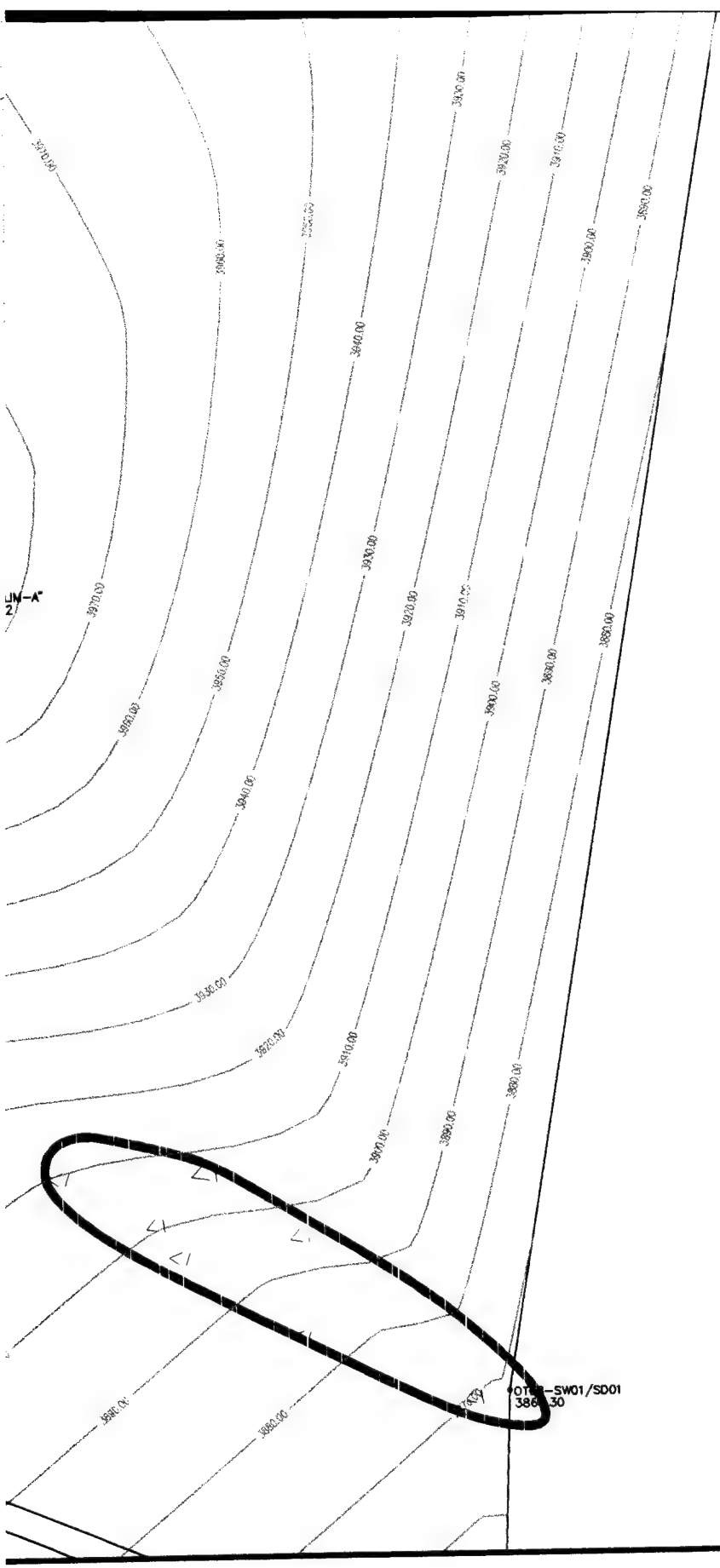
3940.00
3930.00
3920.00
3910.00
3900.00



0 50

SCAL

PROJ. MGR. R.HENRY	ACAD FILE PLATE2
DRAWN BY RLB	PROJ. NO. 05-G-

LONG

ENV

0 50 100 200

SCALE IN FEET

INDIAN MOUNTAIN
LONG RANGE RADAR STATION

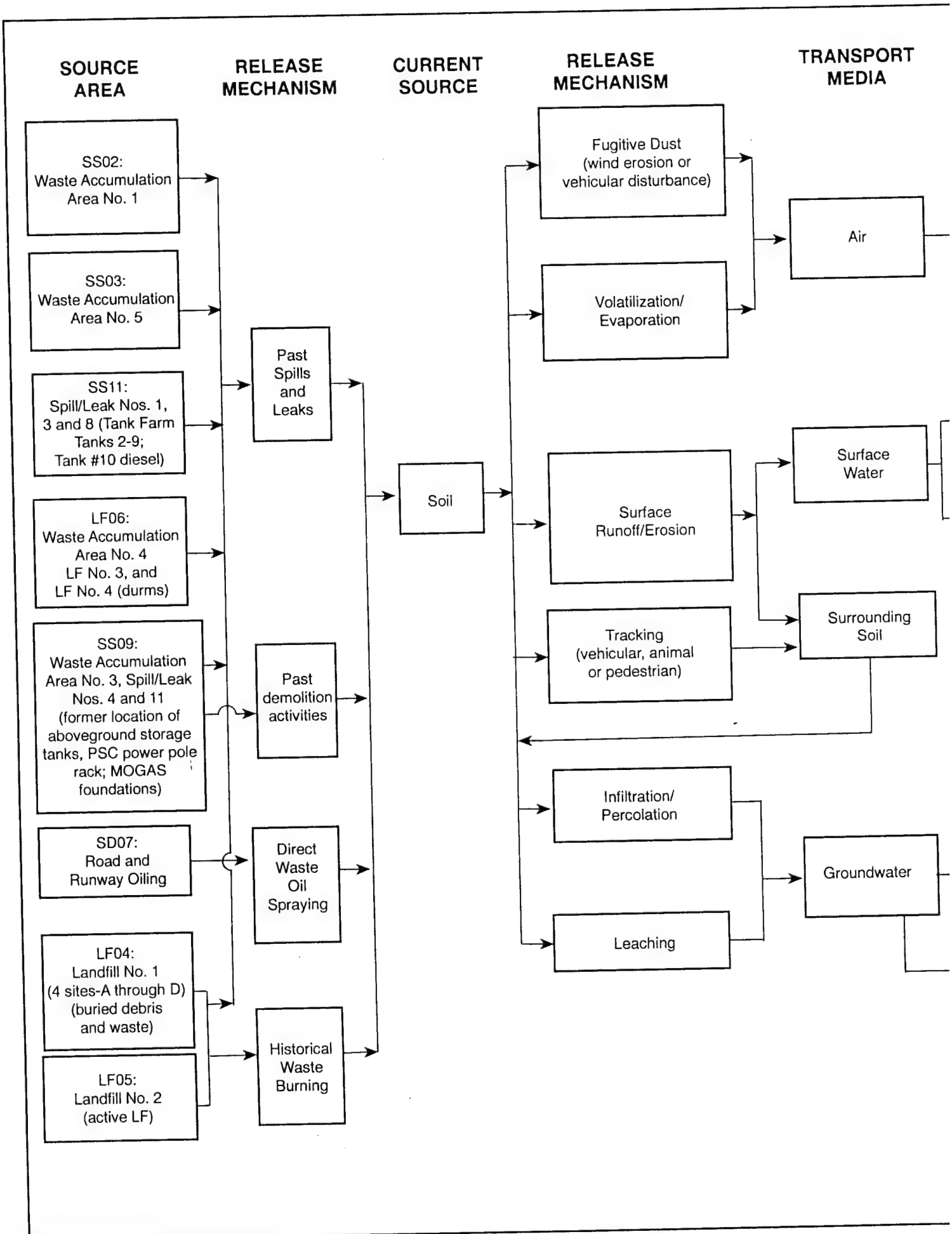
ENVIRONMENTAL CONDITION
OF PROPERTY
UPPER CAMP

MGR. NRY	ACAD FILE NO. PLATE2	FIGURE NO. PLATE 2	
BY	PROJ. NO. 05-G-46200		DATE 2/13/95

Appendix E presents the draft conceptual site models (CSMs) prepared for both Lower Camp and Upper Camp. Included are Figures 1 and 2 which present the CSMs for Lower Camp and Figures 3 and 4 which present the CSMs for Upper Camp. For each site, the CSMs are presented in an illustrative (cross-section view) and flow diagram format.

APPENDIX E

CONCEPTUAL SITE MODELS



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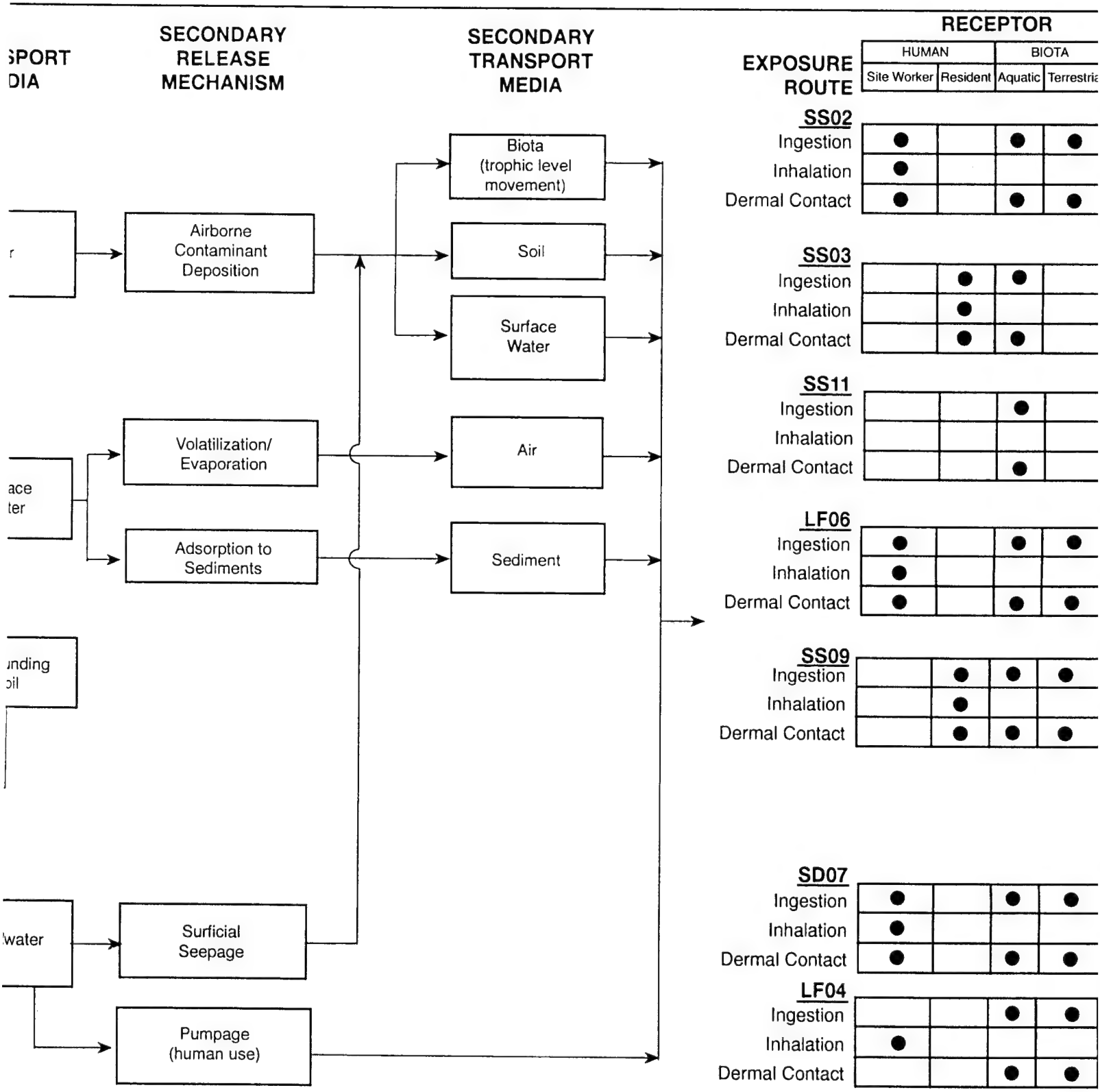
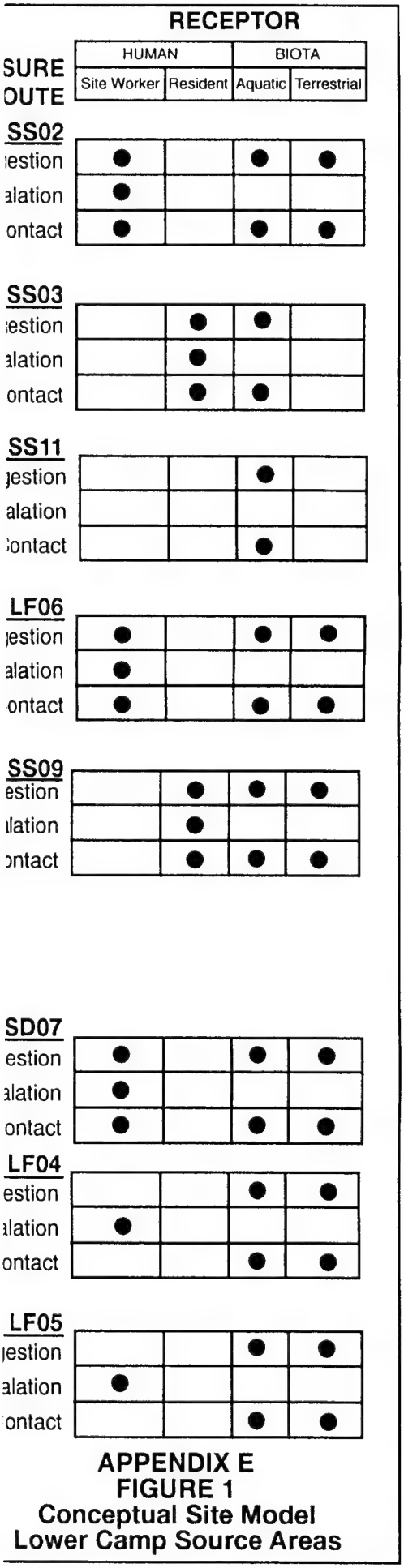
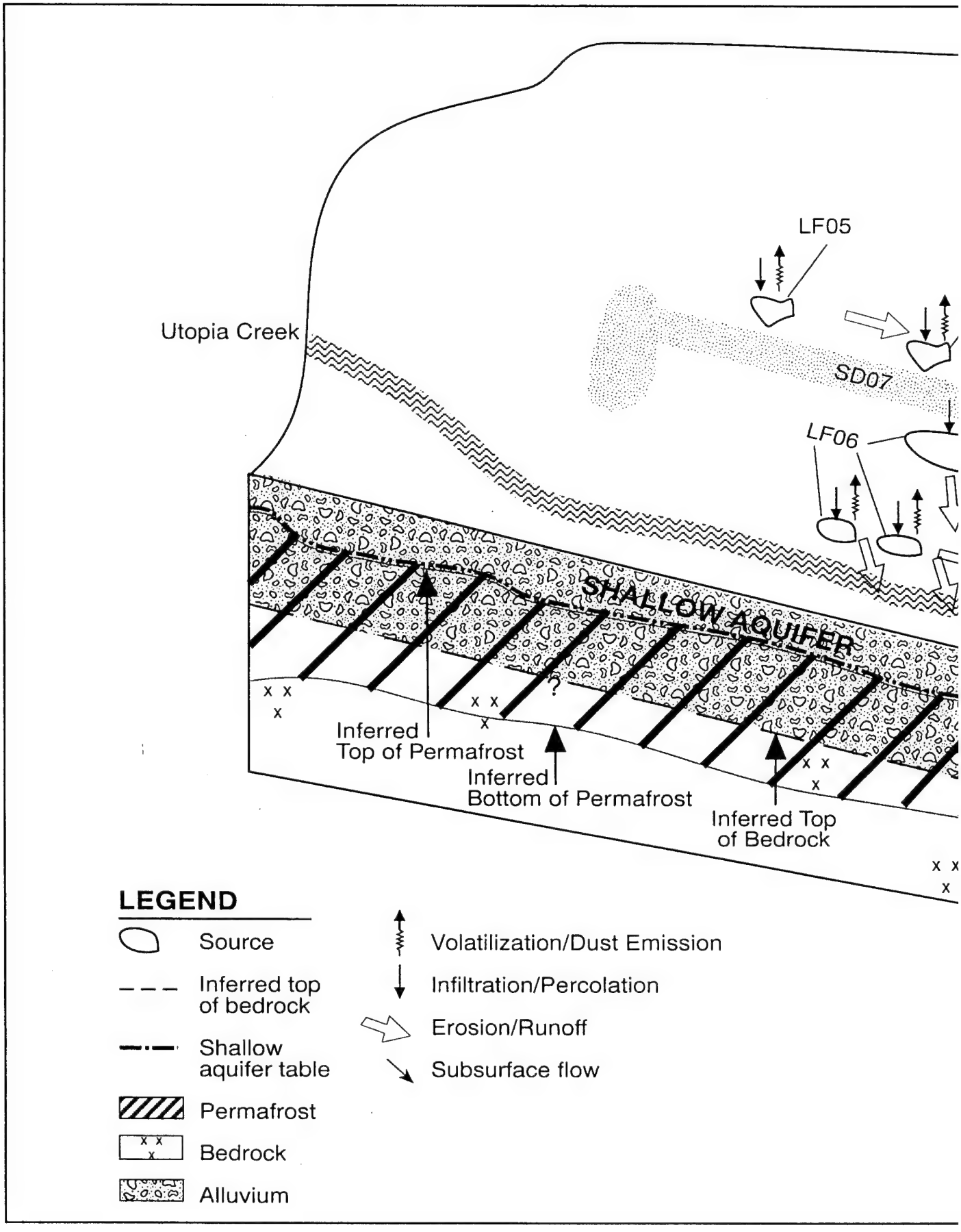


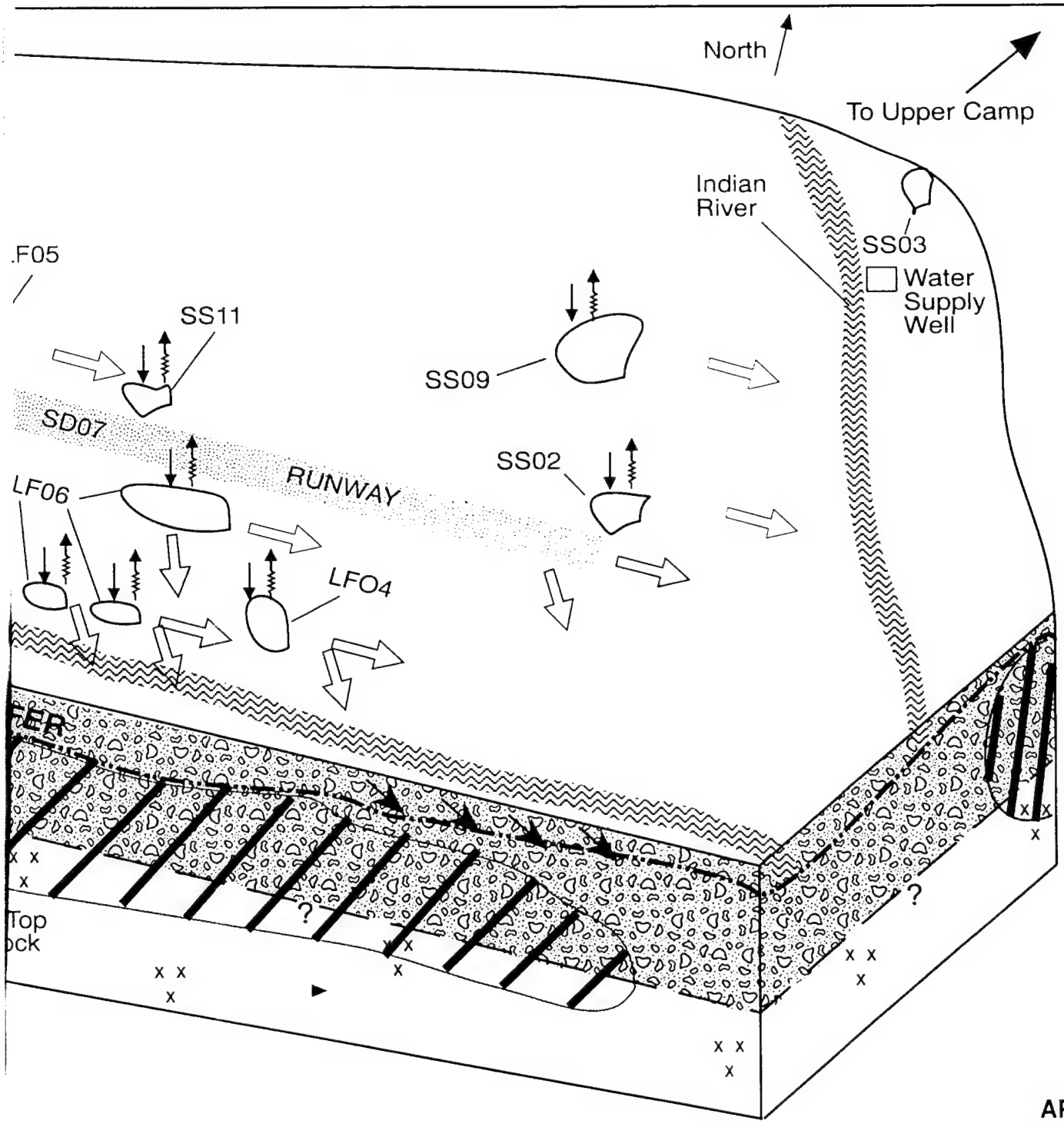
APPENDIX E
FIGURE 1
Conceptual Site Model
Lower Camp Source Areas



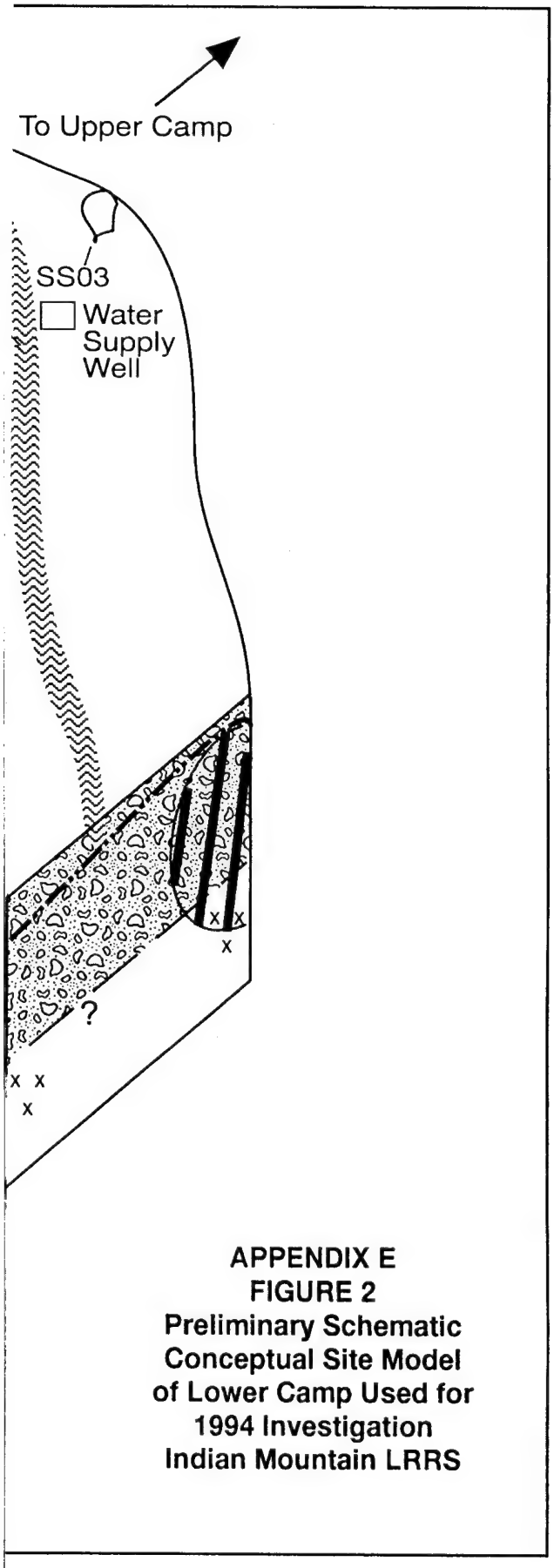
APPENDIX E
FIGURE 1
Conceptual Site Model
Lower Camp Source Areas



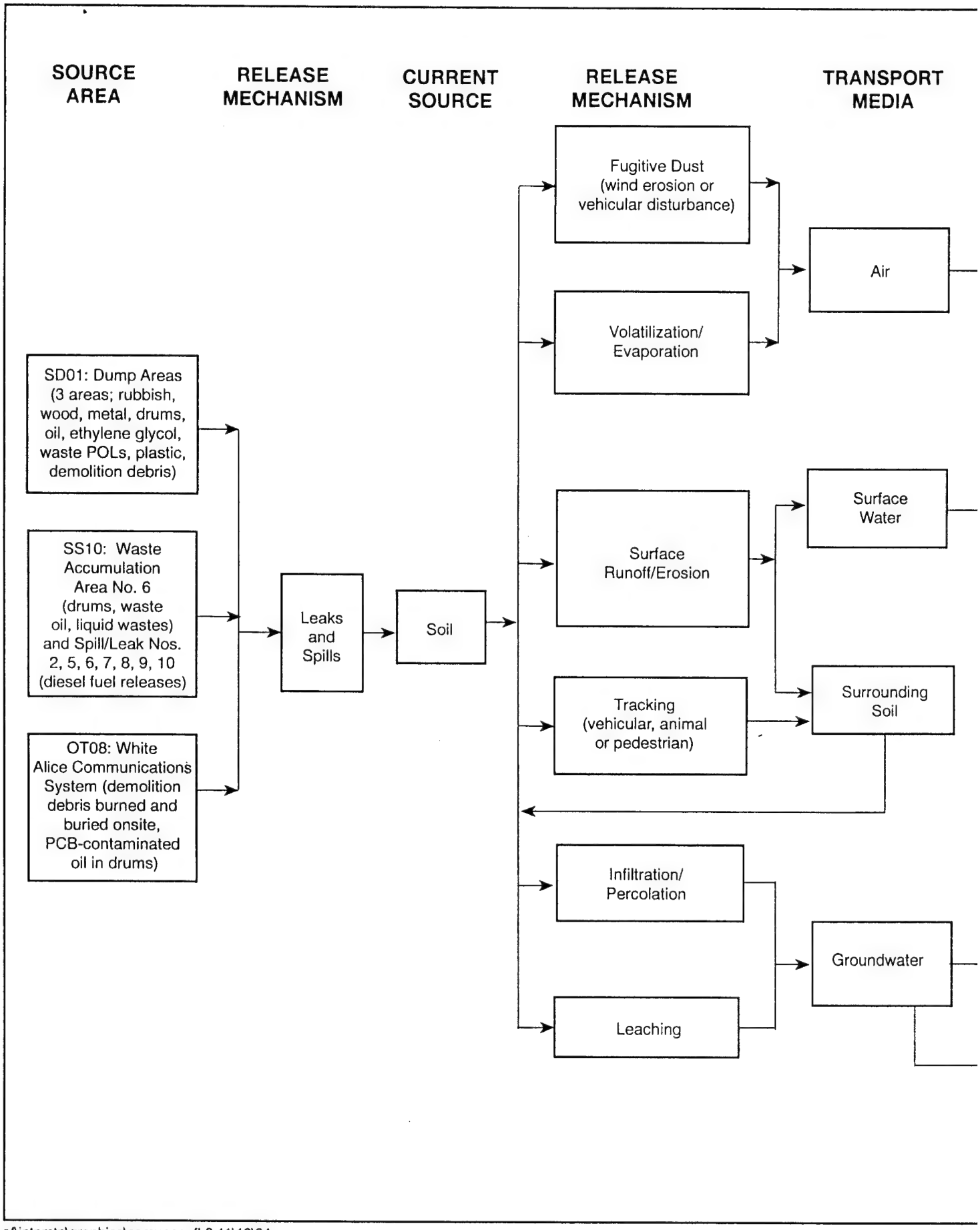
af\indn-mtn\fig-pcl.fh3

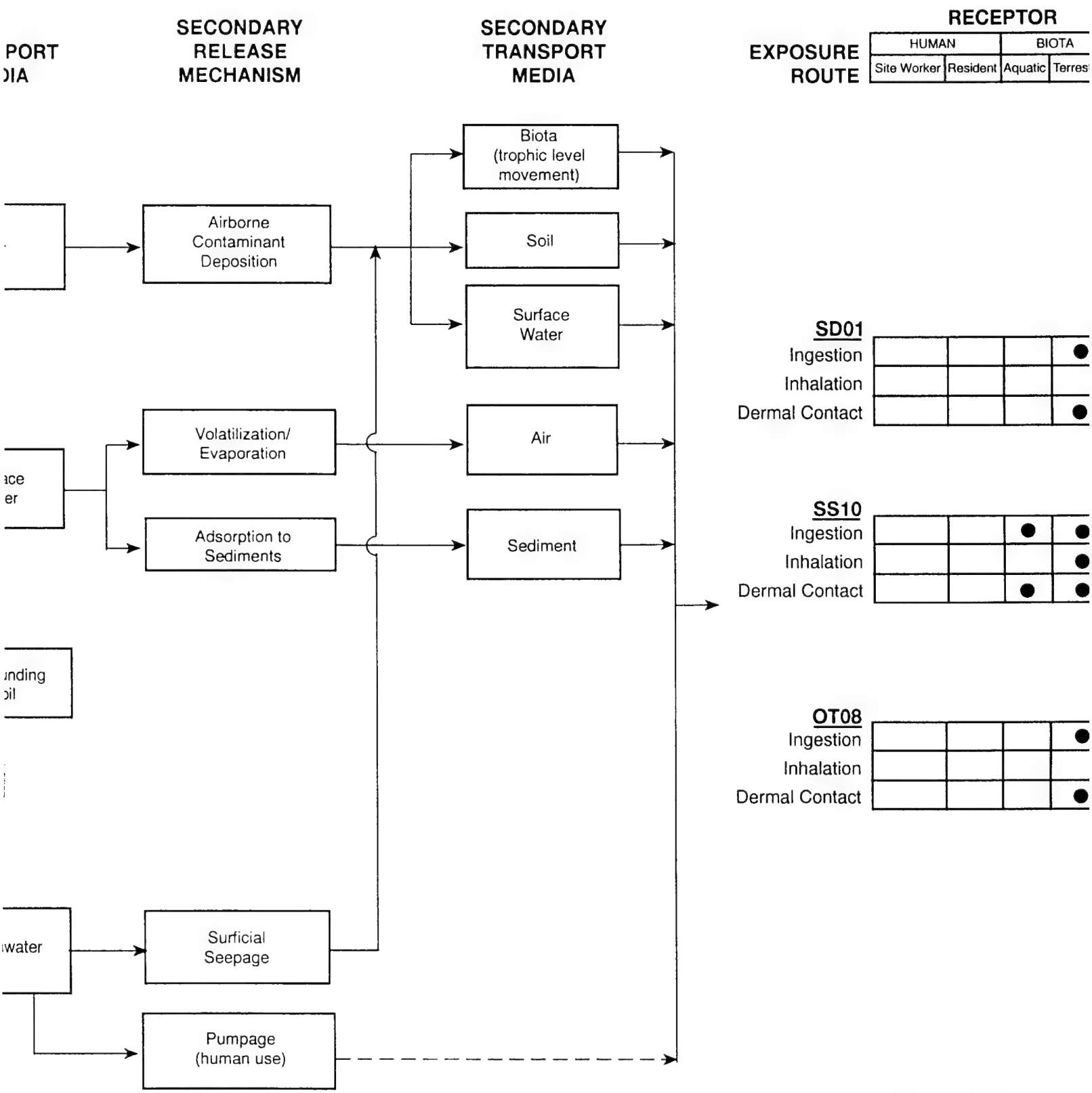


APPENDIX E
FIGURE 2
Preliminary Schematic
Conceptual Site Model
of Lower Camp Used for
1994 Investigation
Indian Mountain LRRS

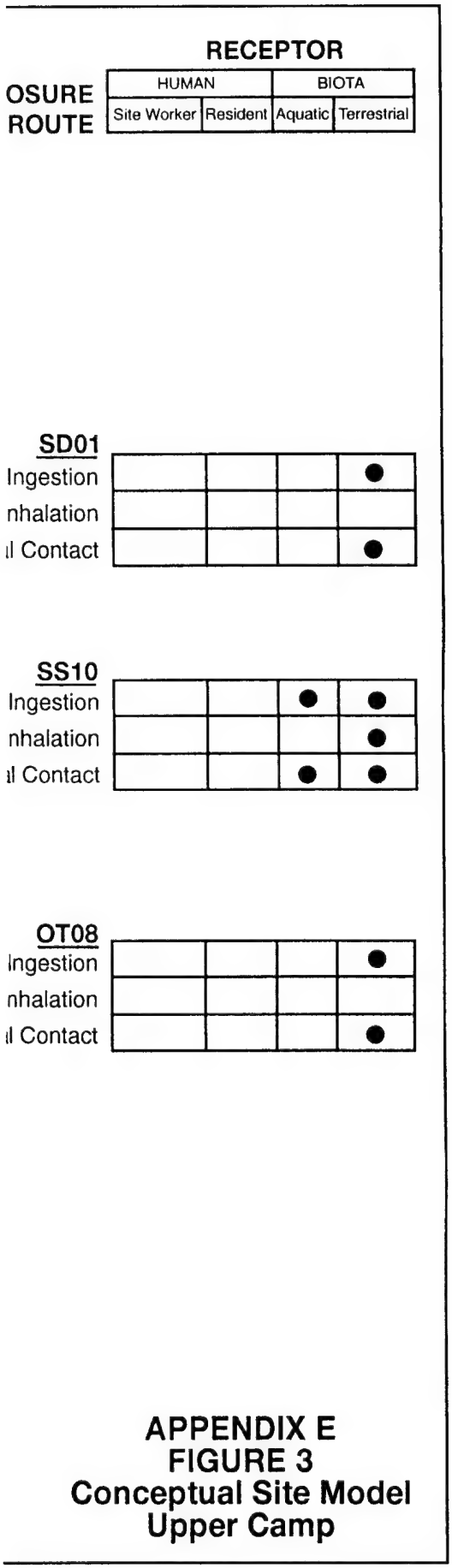


APPENDIX E
FIGURE 2
Preliminary Schematic Conceptual Site Model of Lower Camp Used for 1994 Investigation
Indian Mountain LRRS

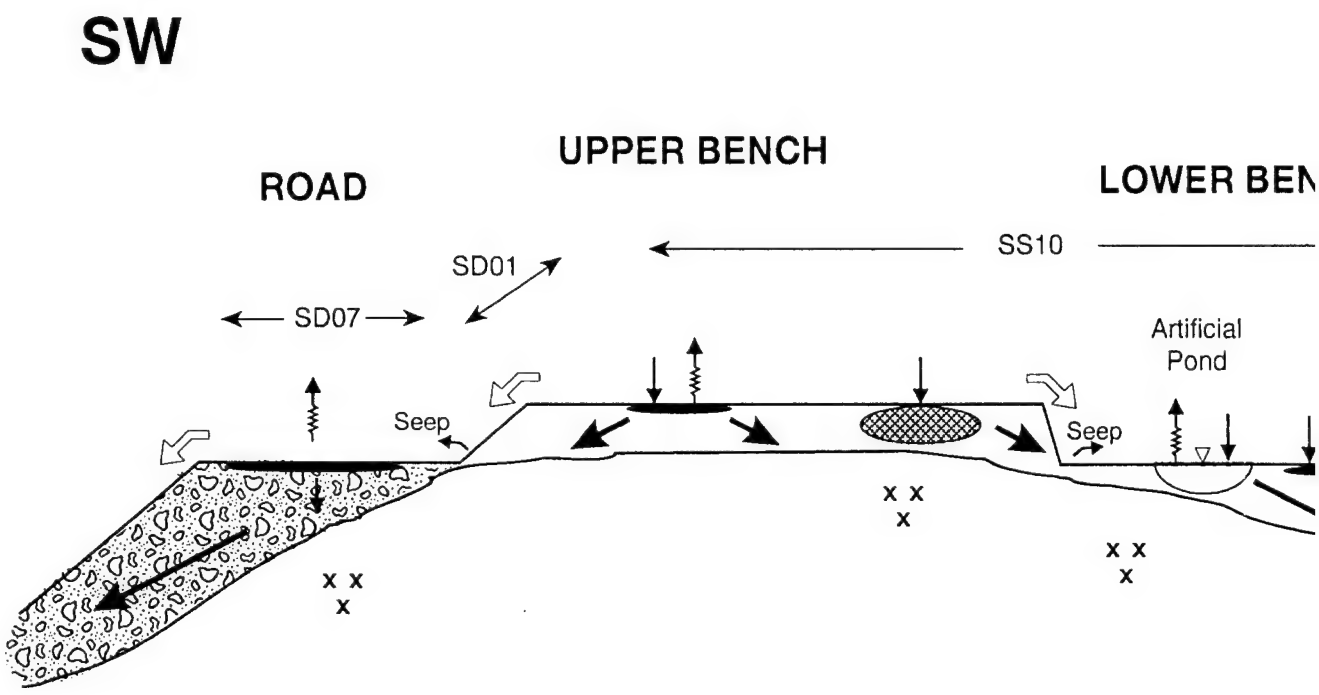

SOURCE AREA
RELEASE MECHANISM
CURRENT SOURCE
RELEASE MECHANISM
TRANSPORT MEDIA
SD01: Dump Areas (3 areas; rubbish, wood, metal, drums, oil, ethylene glycol, waste POLs, plastic, demolition debris)
SS10: Waste Accumulation Area No. 6 (drums, waste oil, liquid wastes) and Spill/Leak Nos. 2, 5, 6, 7, 8, 9, 10 (diesel fuel releases)
OT08: White Alice Communications System (demolition debris burned and buried onsite, PCB-contaminated oil in drums)
Leaks and Spills
Soil
Fugitive Dust (wind erosion or vehicular disturbance)
Volatilization/ Evaporation
Air
Surface Runoff/Erosion
Surface Water
Tracking (vehicular, animal or pedestrian)
Surrounding Soil
Infiltration/ Percolation
Leaching
Groundwater



APPENDIX E
FIGURE 3
Conceptual Site Mod
Upper Camp



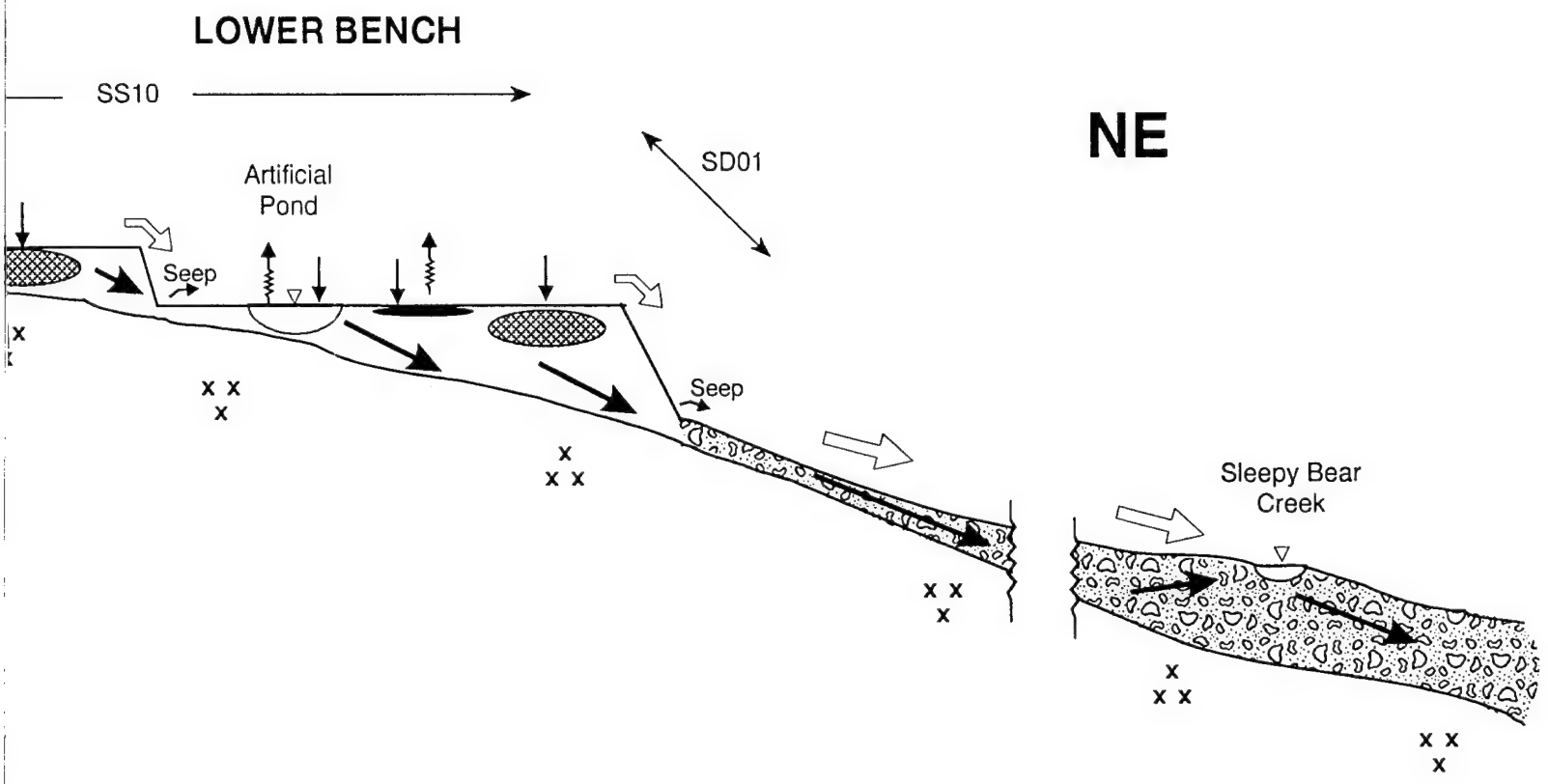
APPENDIX E
FIGURE 3
Conceptual Site Model
Upper Camp

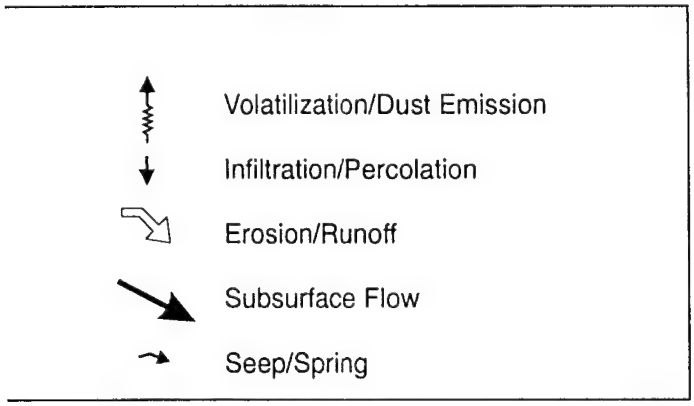


NOT TO SCALE

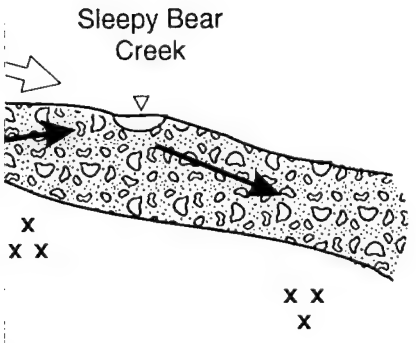
LEGEND

- Bedrock
- Weathered Bedrock/Fill
- Alluvium/ Colluvium
- Surface Spill/ Road Oiling
- Landfill/ Buried Debris
- Surface Water Elevation
- Volatilization/Du
- Infiltration/Perco
- Erosion/Runoff
- Subsurface Flow
- Seep/Spring

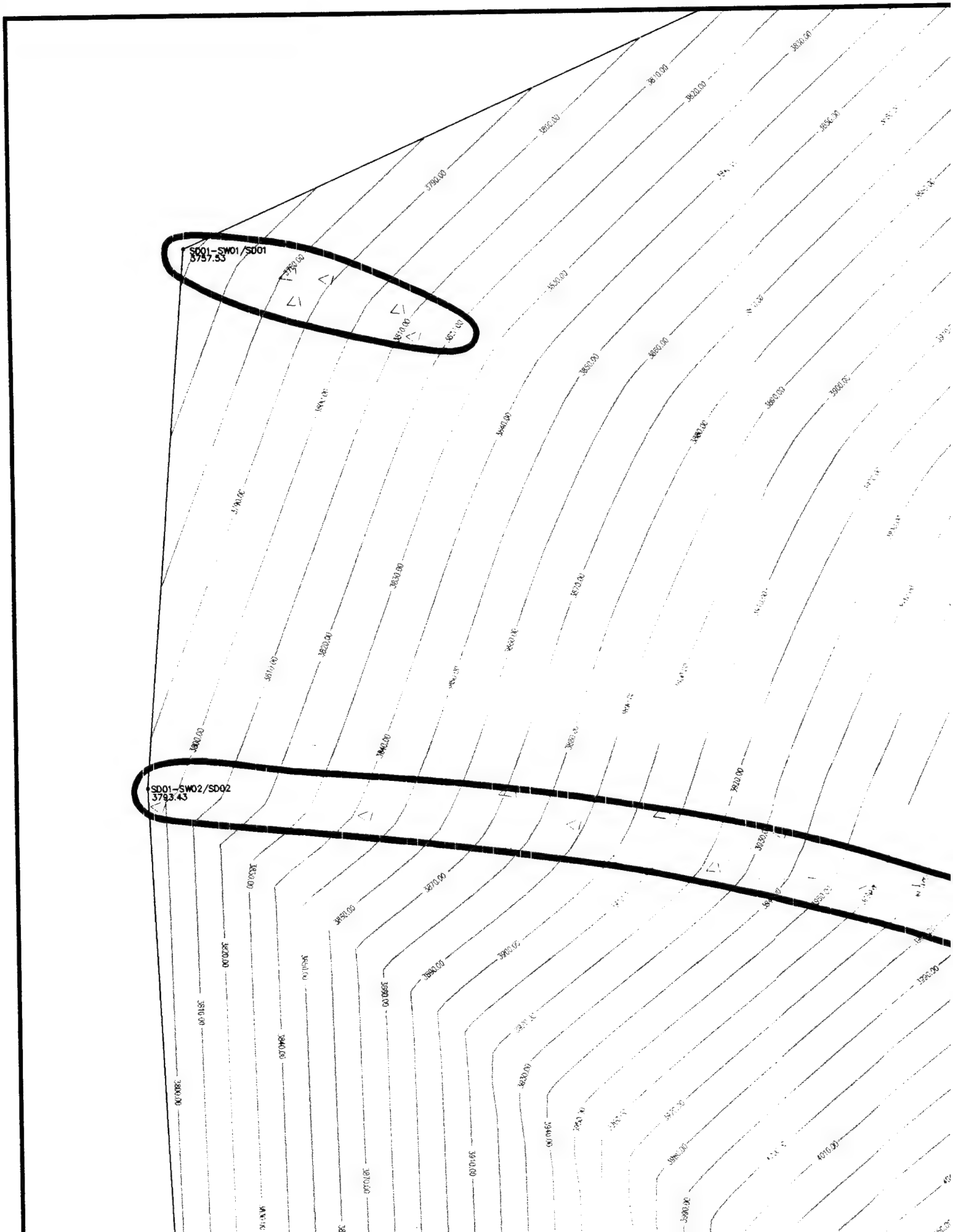


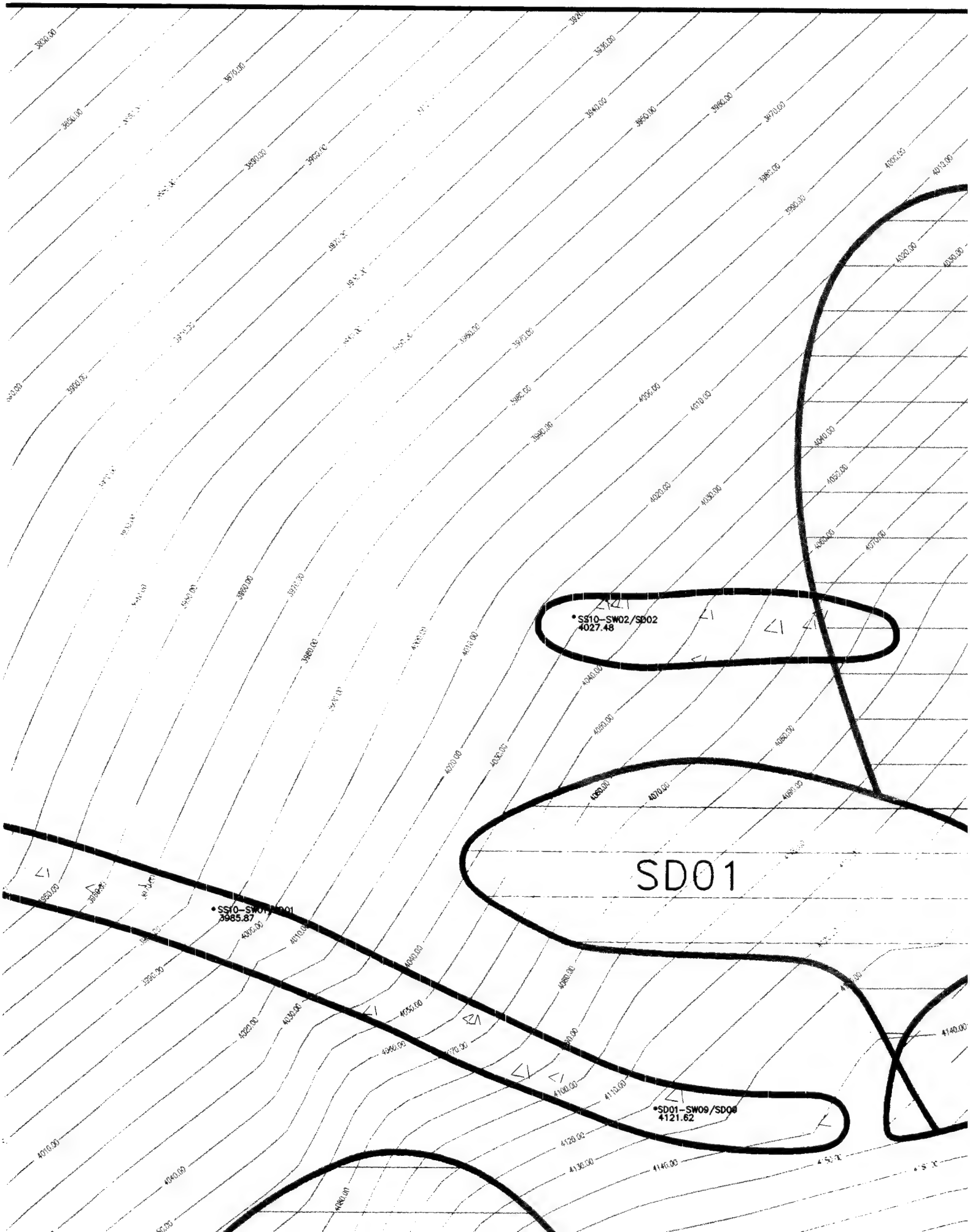


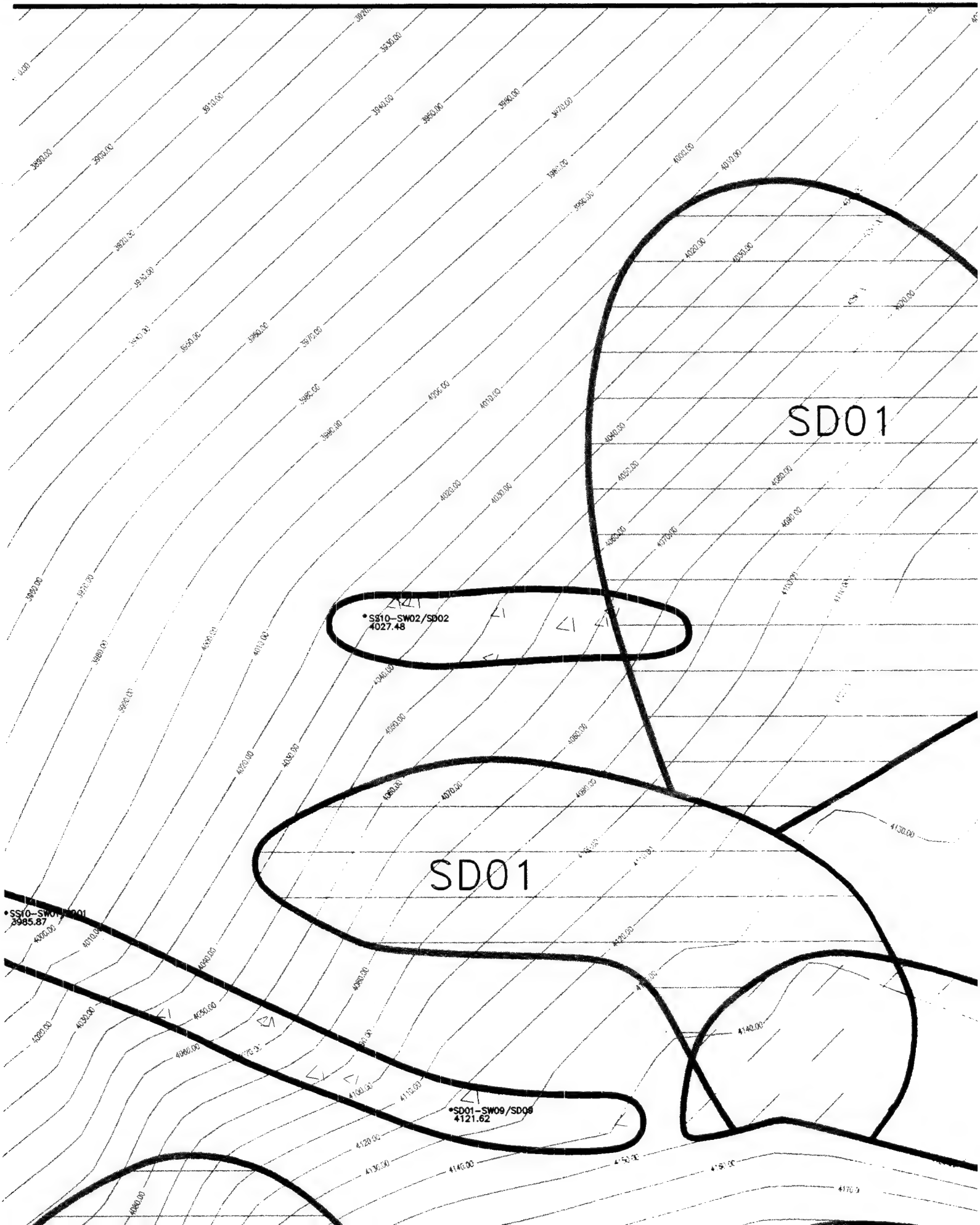
APPENDIX
FIGURE 4
Preliminary Sch
Conceptual Site
of Upper Camp U
1994 Investig
Indian Mountain

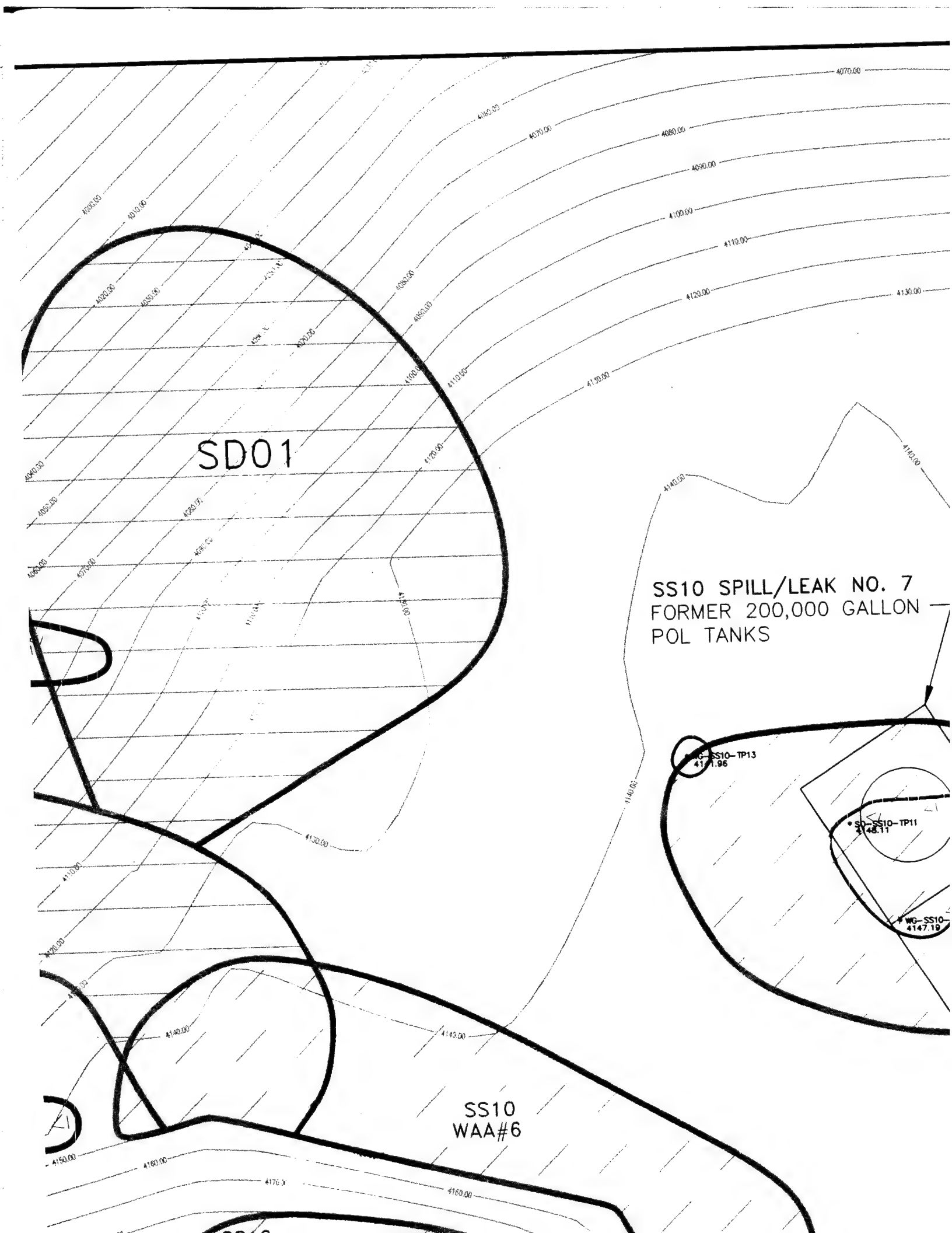


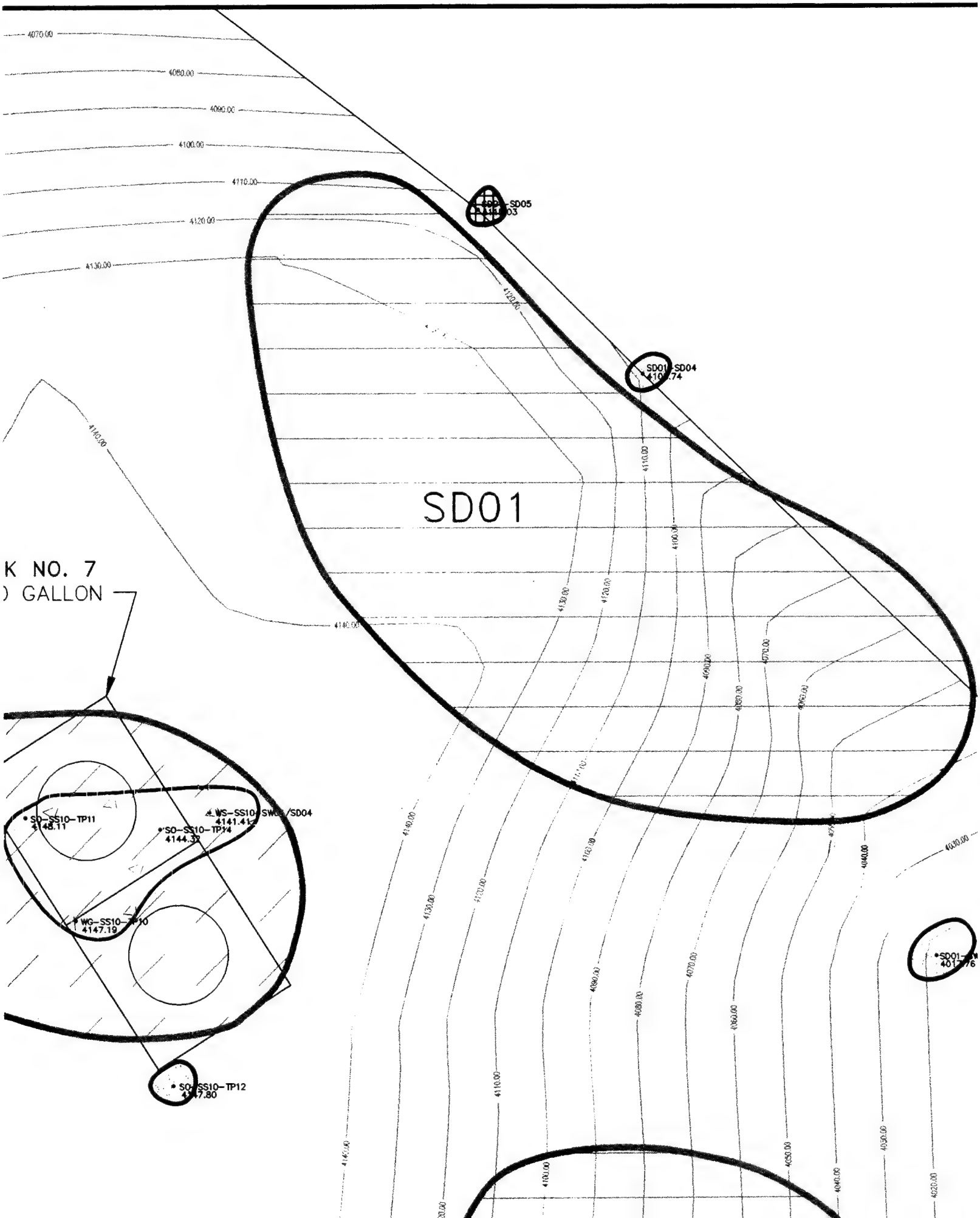
APPENDIX E
FIGURE 4
Preliminary Schematic Conceptual Site Model of Upper Camp Used for 1994 Investigation
Indian Mountain LRRS


SD01-SW01/SD01
3757.53
SD01-SW02/SD02
3793.43


SS10-SW02/SD02
4027.48
SD01
SS10-SW01/SD01
3985.87
SD01-SW09/SD08
4121.62


SD01
SD01
•SS10–SW02/SD02
4027.48
•SD01–SW09/SD09
4121.62


SD01
SS10 SPILL/LEAK NO. 7
FORMER 200,000 GALLON
POL TANKS
WG-SS10-TP13
4141.96
SD-SS10-TP11
4148.11
WG-SS10-
4147.19
SS10
WAA#6


SD01
K NO. 7
) GALLON
SO-SS10-TP11
4148.11
SO-SS10-TP14
4144.32
WS-SS10-SWC
4141.41
WC-SS10-TP10
4147.19
SO-SS10-TP12
SD05
SD04
4100.00
4110.00
4120.00
4130.00
4140.00
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4070.00
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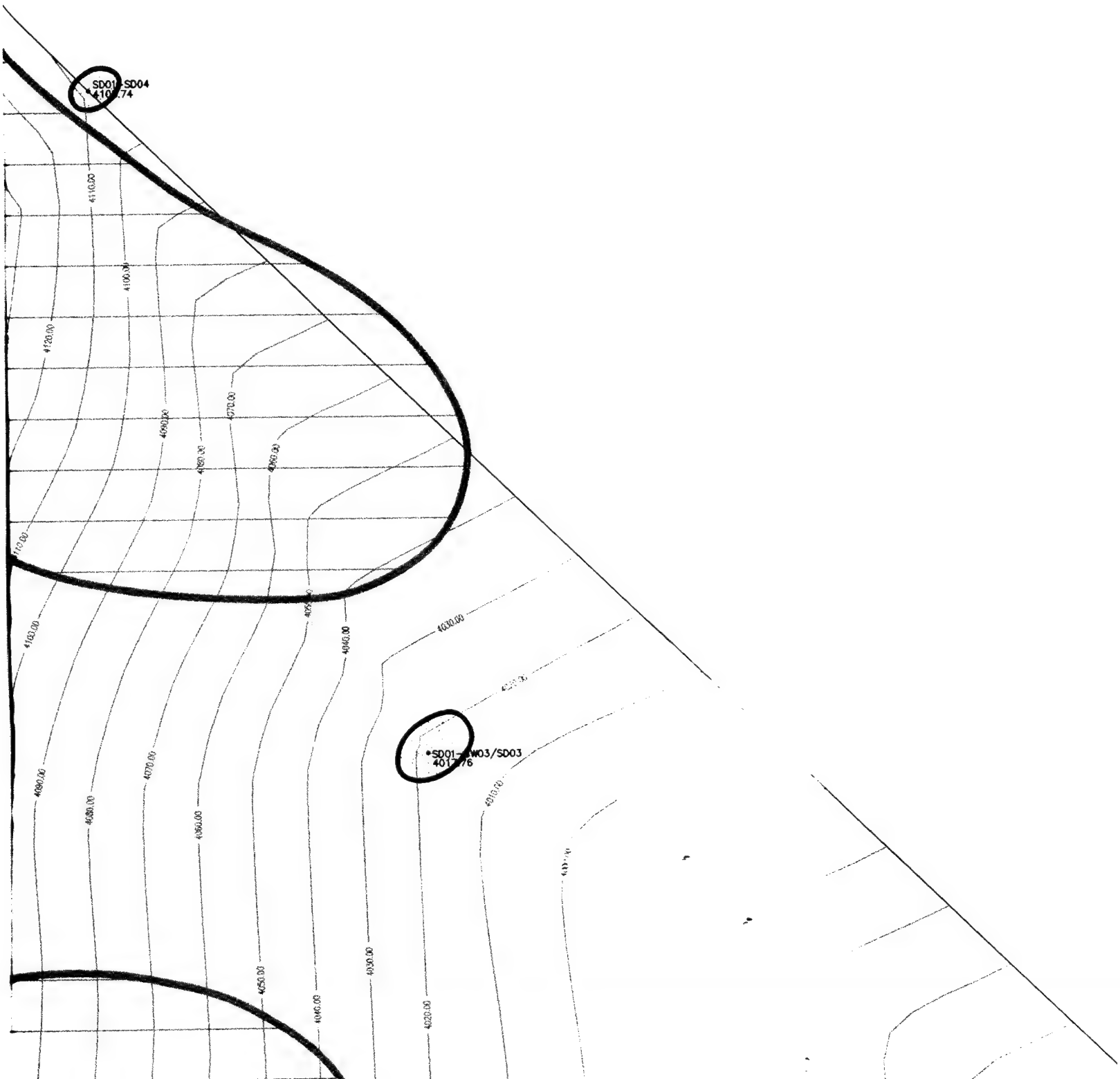
4080.00
4050.00
4040.00
4030.00
4020.00


SD01-SD04
4109.74
4110.00
4100.00
4120.00
4090.00
4080.00
4070.00
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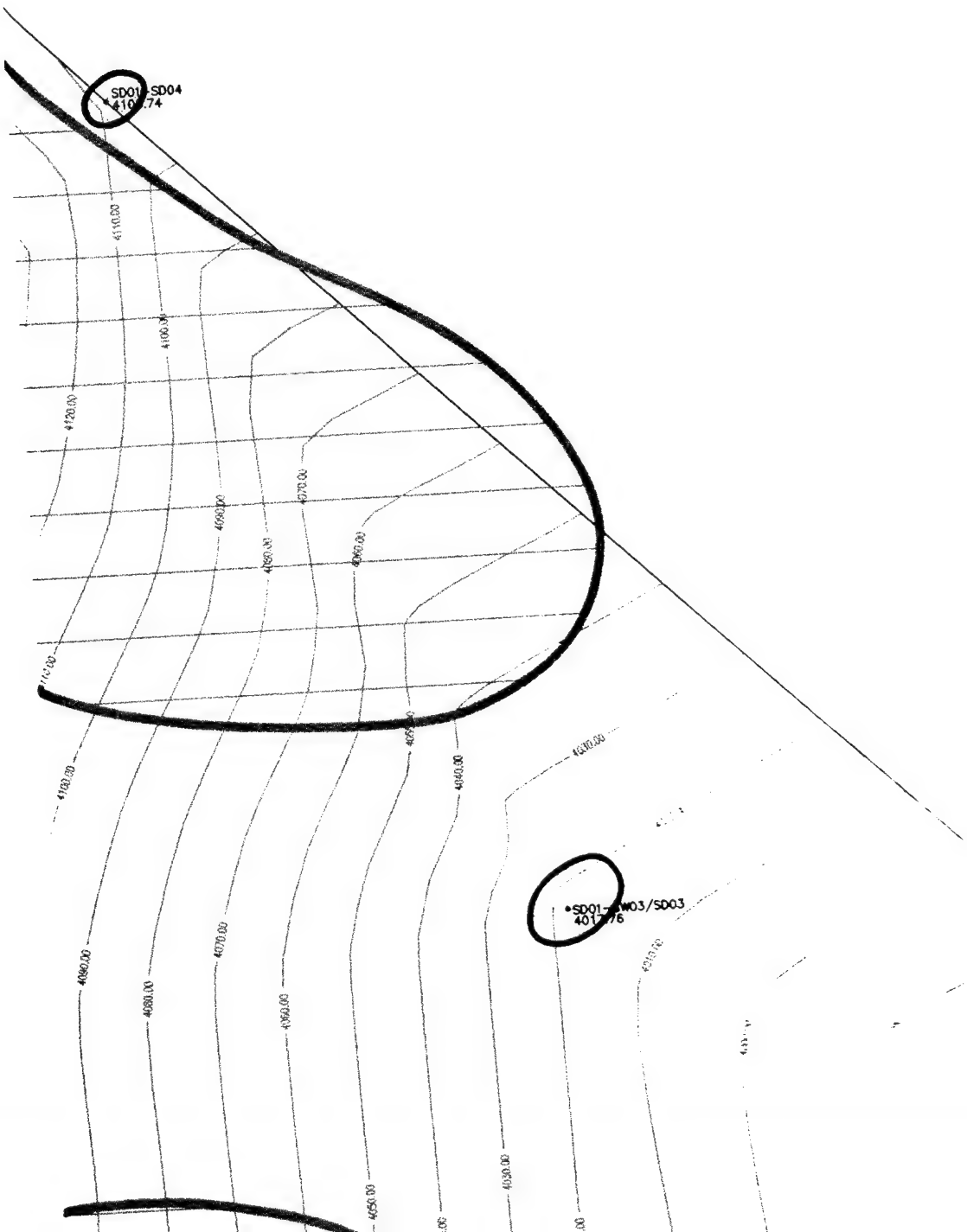
4040.00
4030.00
4020.00
4010.00
4000.00
SD01-SW03/SD03
4013.76


SD01-SD04
4110.00
4120.00
4090.00
4080.00
4070.00
4060.00
4050.00
4040.00
4030.00
4020.00
4010.00
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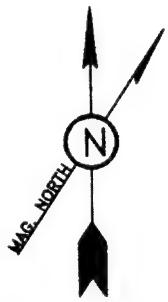
4010.00
4000.00

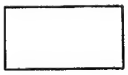


MAGNETIC DECLINATION : 24° 42'
ANNUAL RATE OF CHANGE : 4.1'
U.S.G.S. EPOCH 1985

LEGEND

DUMP AREAS

WASTE ACCUMULATION AND FUEL RELEASE AREAS

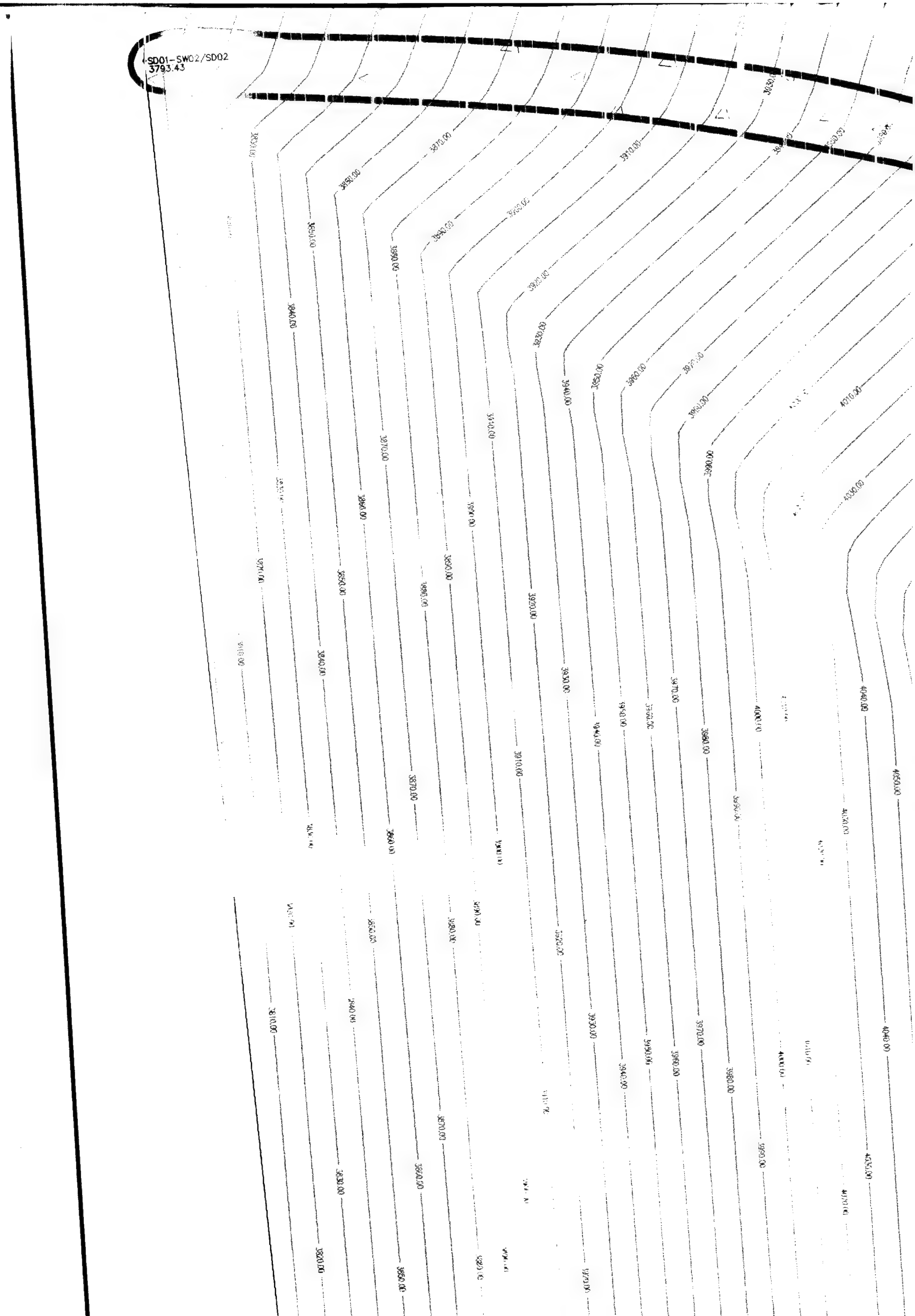


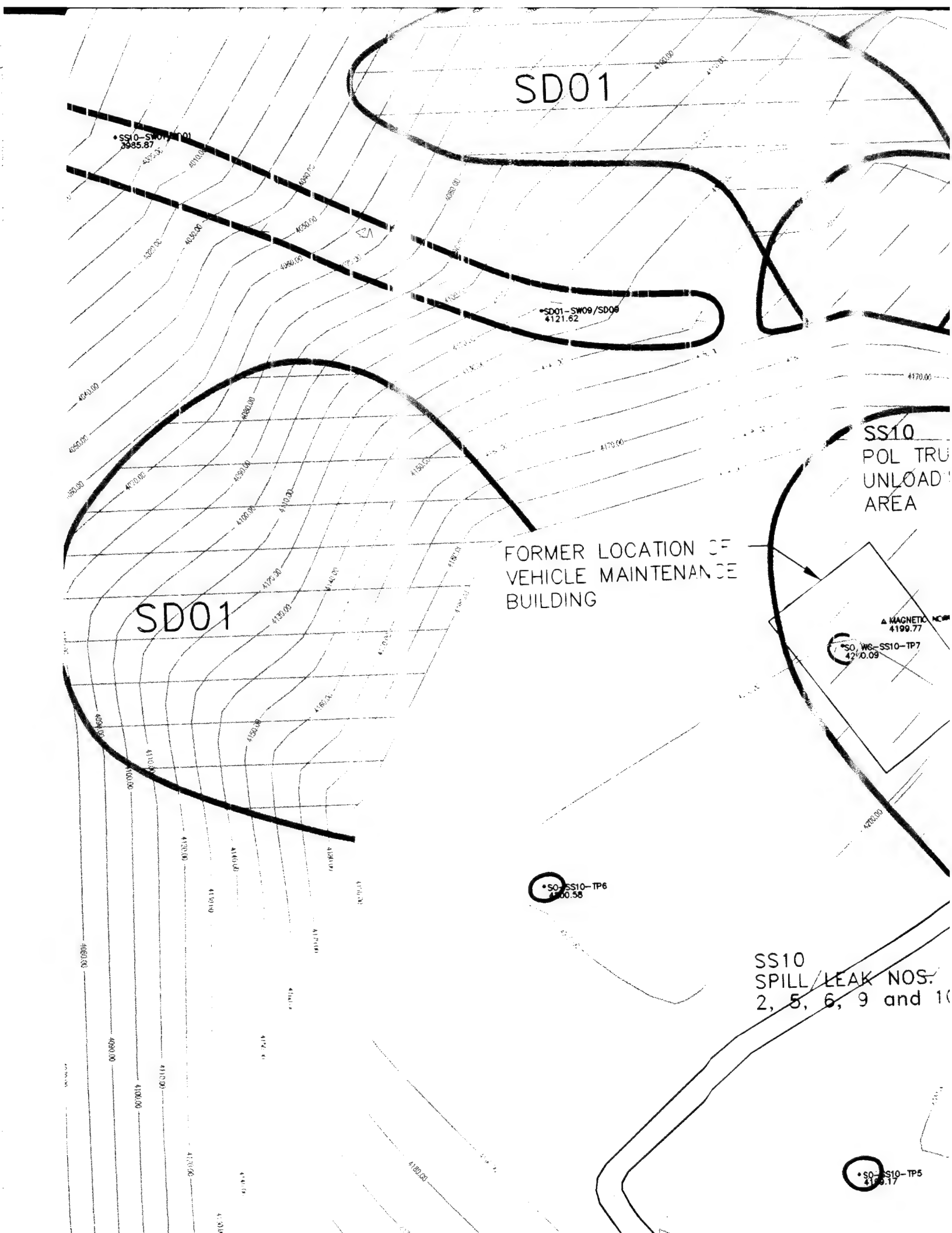
UNEVALUATED AREAS

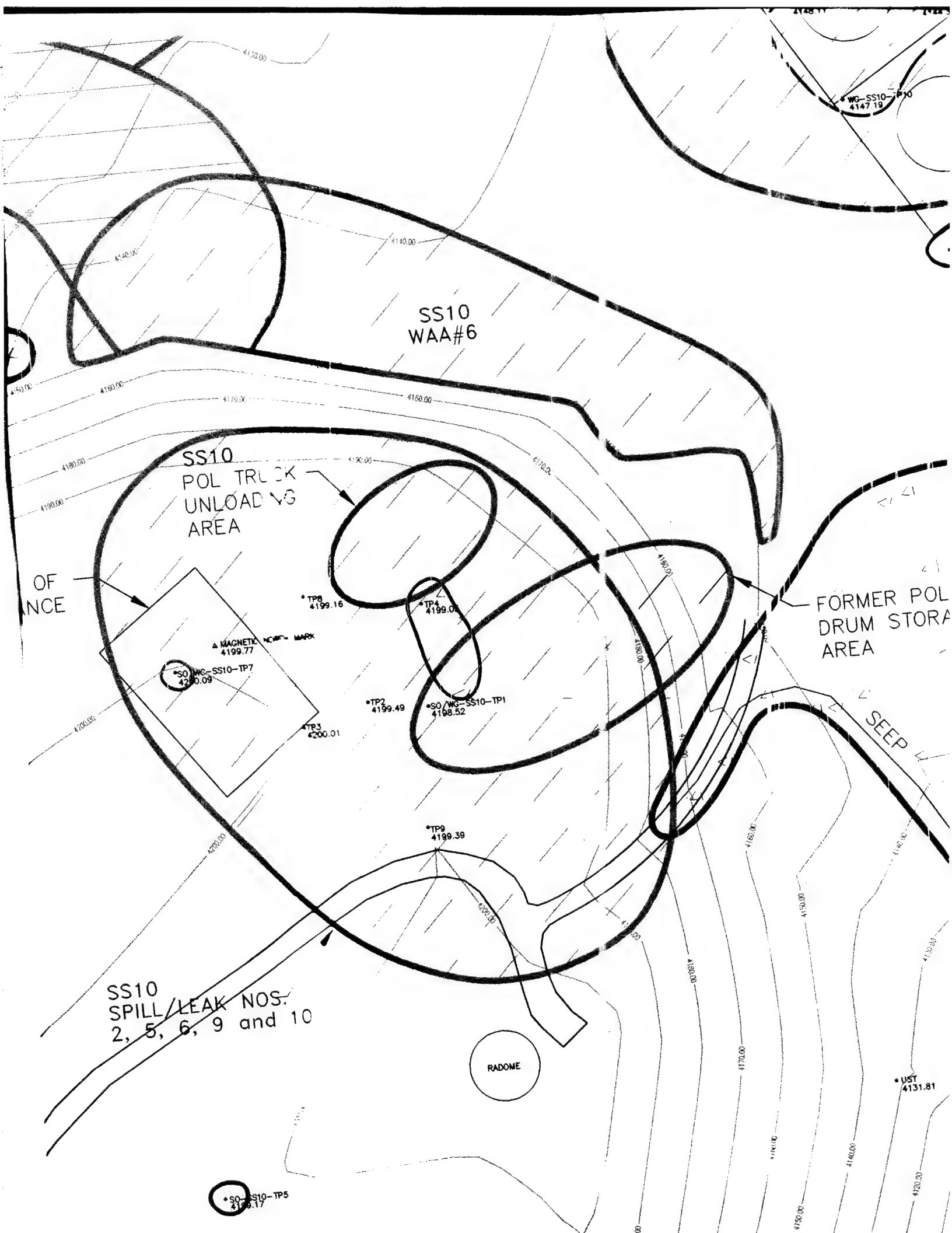
CONTAMINATION ABOVE ACTION LEVELS

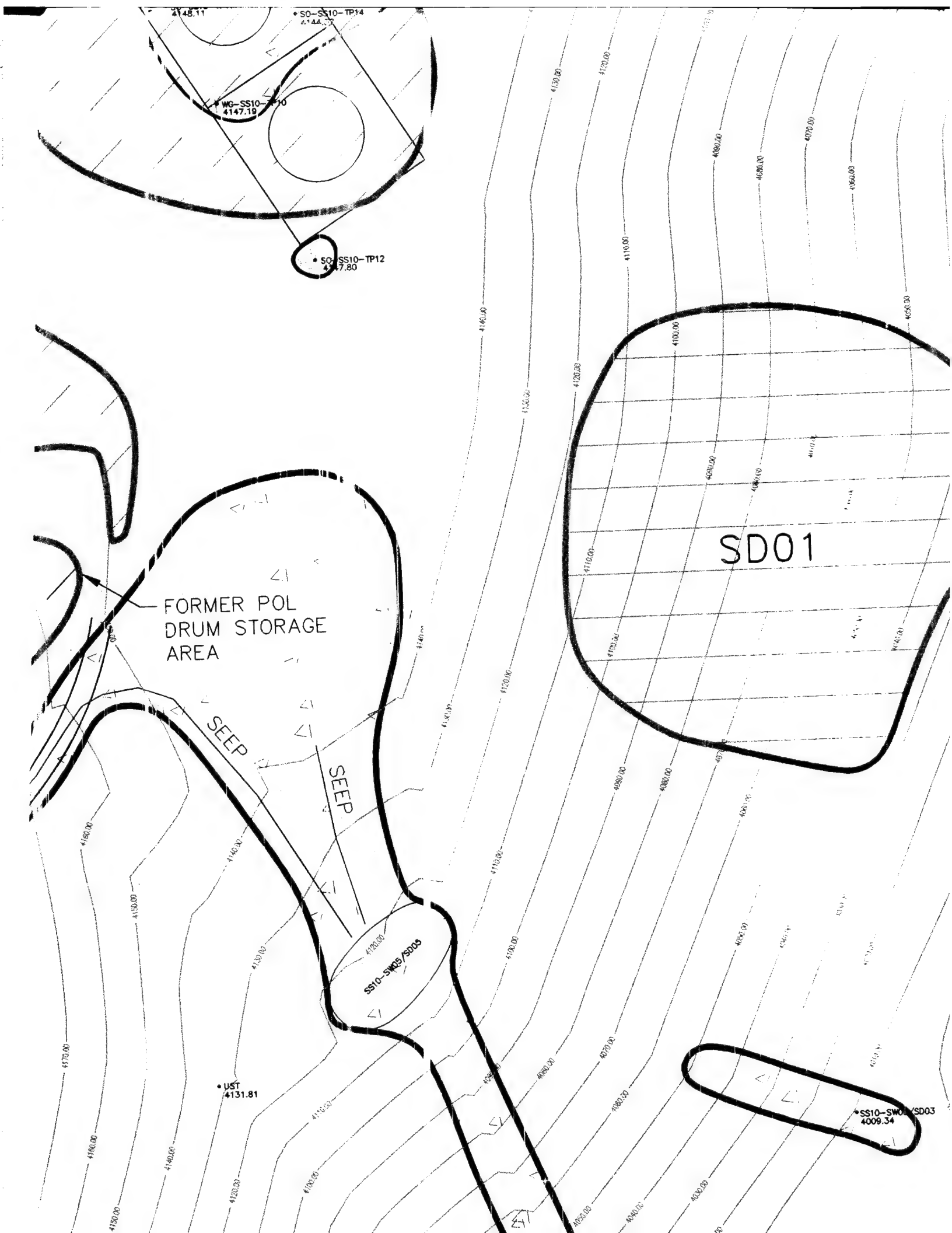
CONTAMINATION BELOW ACTION LEVELS

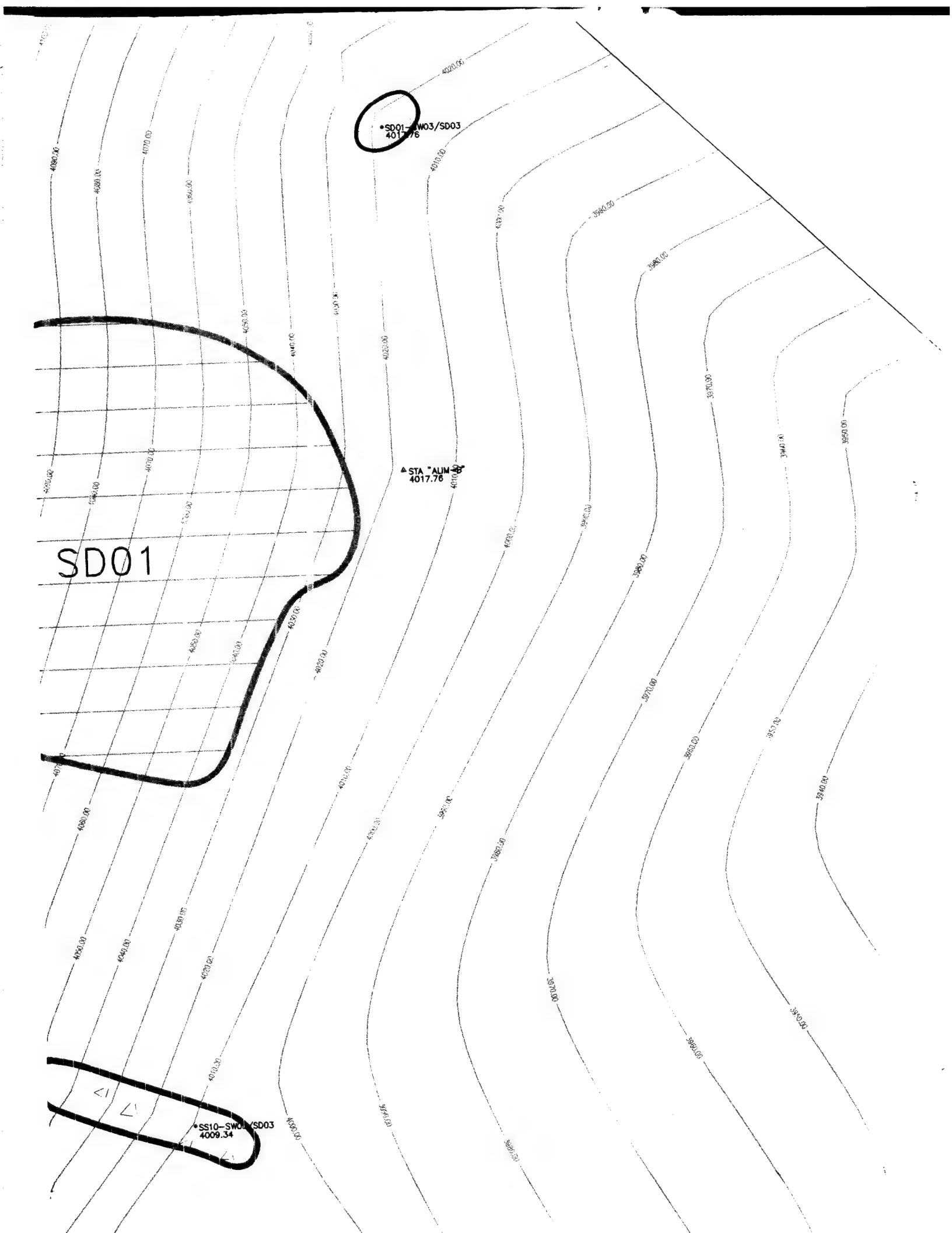
AREA OF NO SUSPECTED CONTAMINATION

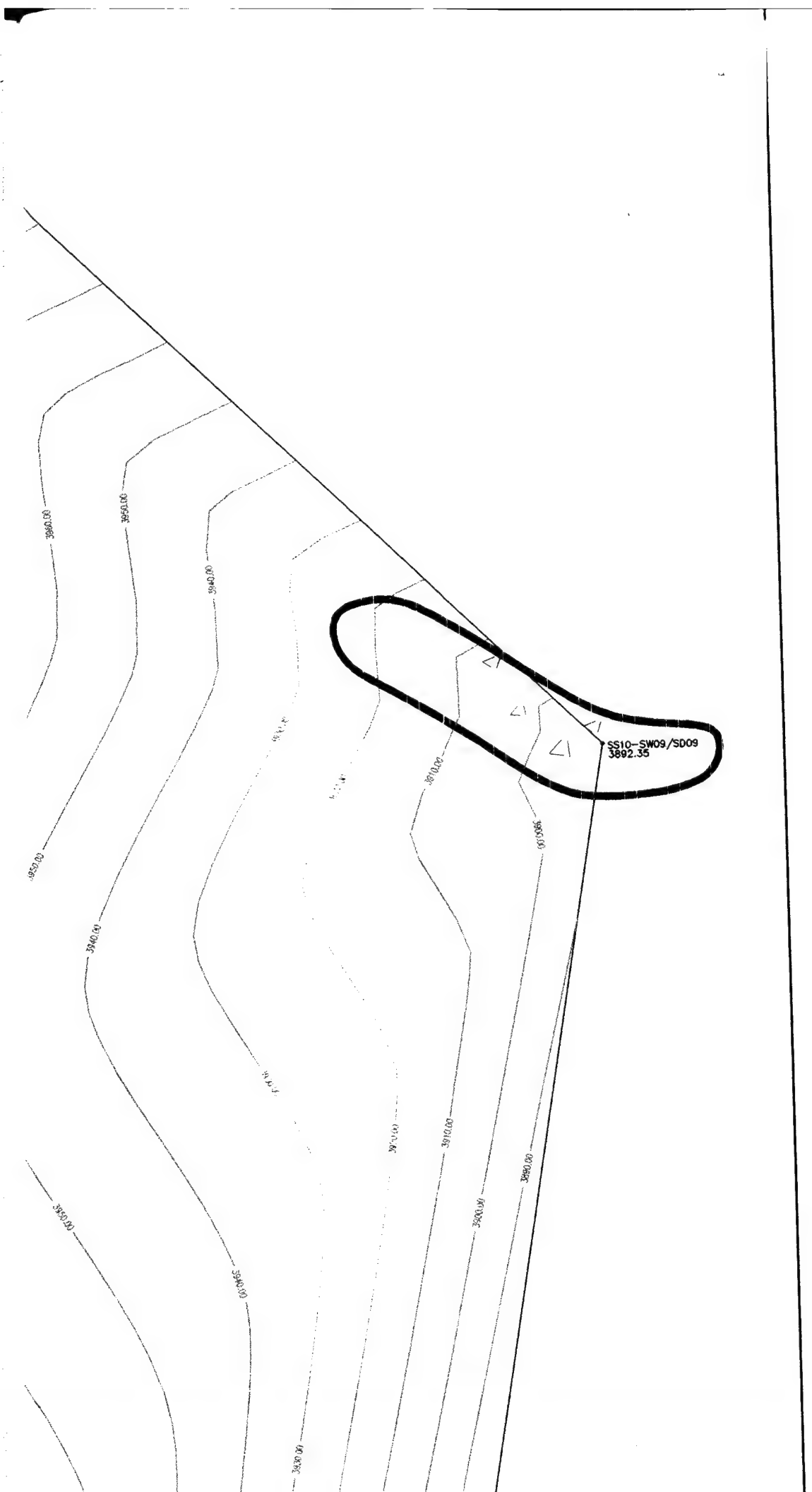

SD01-SW02/SD02
3793.43


SD01
SD01
SS10
POL TRU
UNLOAD
AREA
FORMER LOCATION OF
VEHICLE MAINTENANCE
BUILDING
SS10
SPILL/LEAK NOS.
2, 5, 6, 9 and 1
SD01-SW09/SD09
4121.62
MAGNETIC
4199.77
SO, WG-SS10-TP7
SO-SS10-TP6
SO-SS10-TP5


SS10
WAA#6
SS10
POL TRUCK
UNLOADING
AREA
OF
NCE
FORMER POL
DRUM STORA
AREA
SEEP
SS10
SPILL/LEAK NOS.
2, 5, 6, 9 and 10
RADOME
MAGNETIC NORTH MARK
4199.77
SO/WG-SS10-TP7
4200.09
TP8
4199.16
TP4
4199.0
TP2
4199.49
SO/WG-SS10-TP1
4198.52
TP3
4200.01
TP9
4199.39
WG-SS10-TP10
4147.19
UST
4131.81
SO-SS10-TP5
4199.17


SD01
FORMER POL
DRUM STORAGE
AREA
SEEP
SEEP
SS10-SW05/SD05
SS10-SW04/SD03
4009.34
UST
4131.81
SO-SS10-TP12
SO-SS10-TP14
WG-SS10-TP10
4147.19


SD01
SD01-SW03/SD03
4017.76
STA "ALIM-2B"
4017.76
SS10-SW03/SD03
4009.34

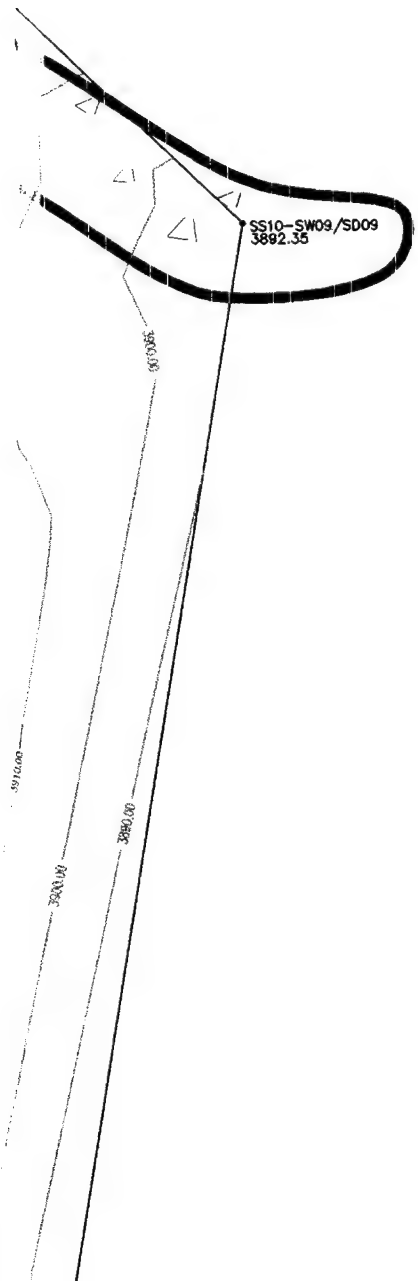


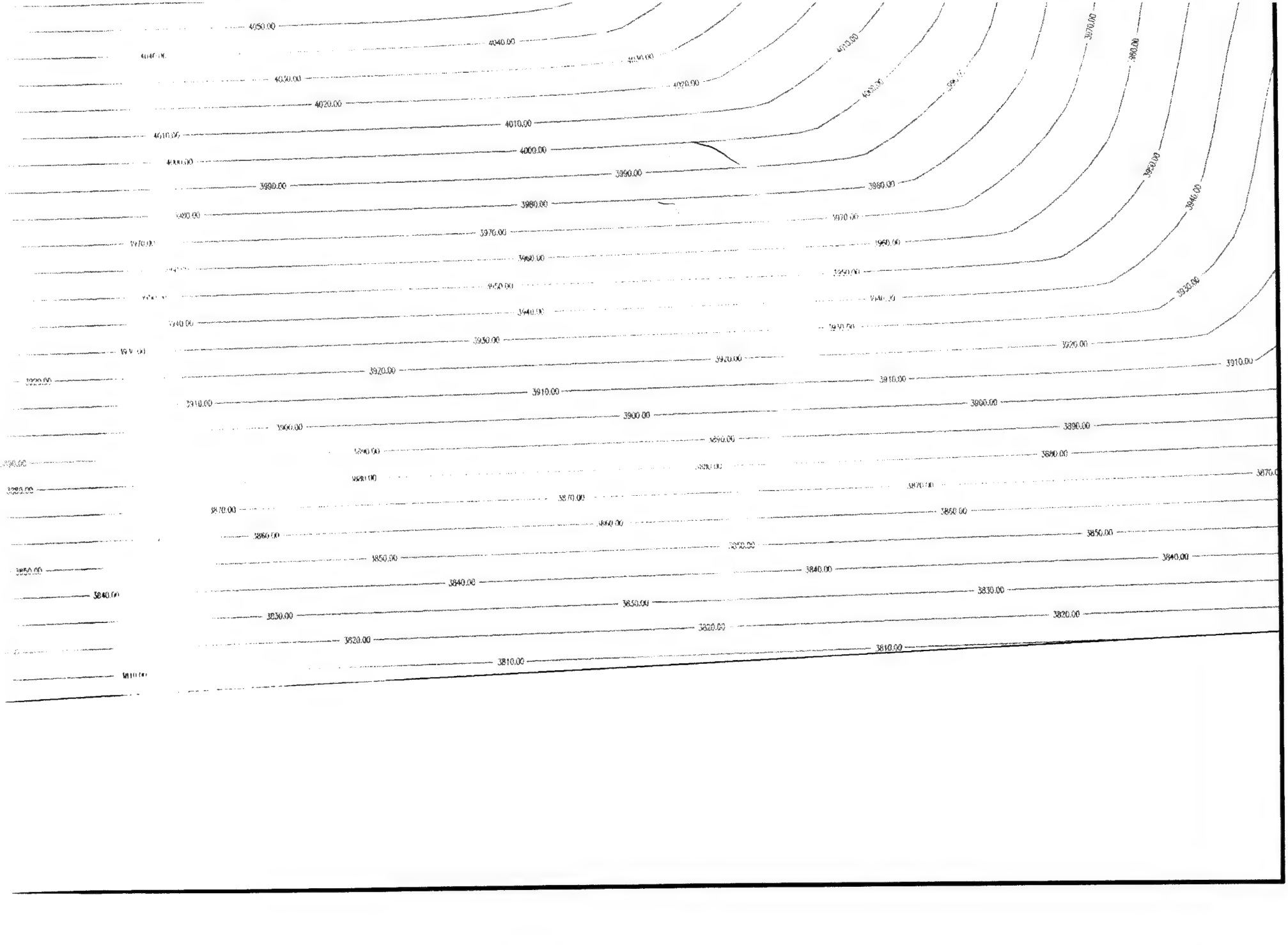
CONTAMINATIC
ACTION LEVEL

AREA OF NO
CONTAMINATIC

CONTAMINATION BELOW ACTION LEVELS

AREA OF NO SUSPECTED CONTAMINATION

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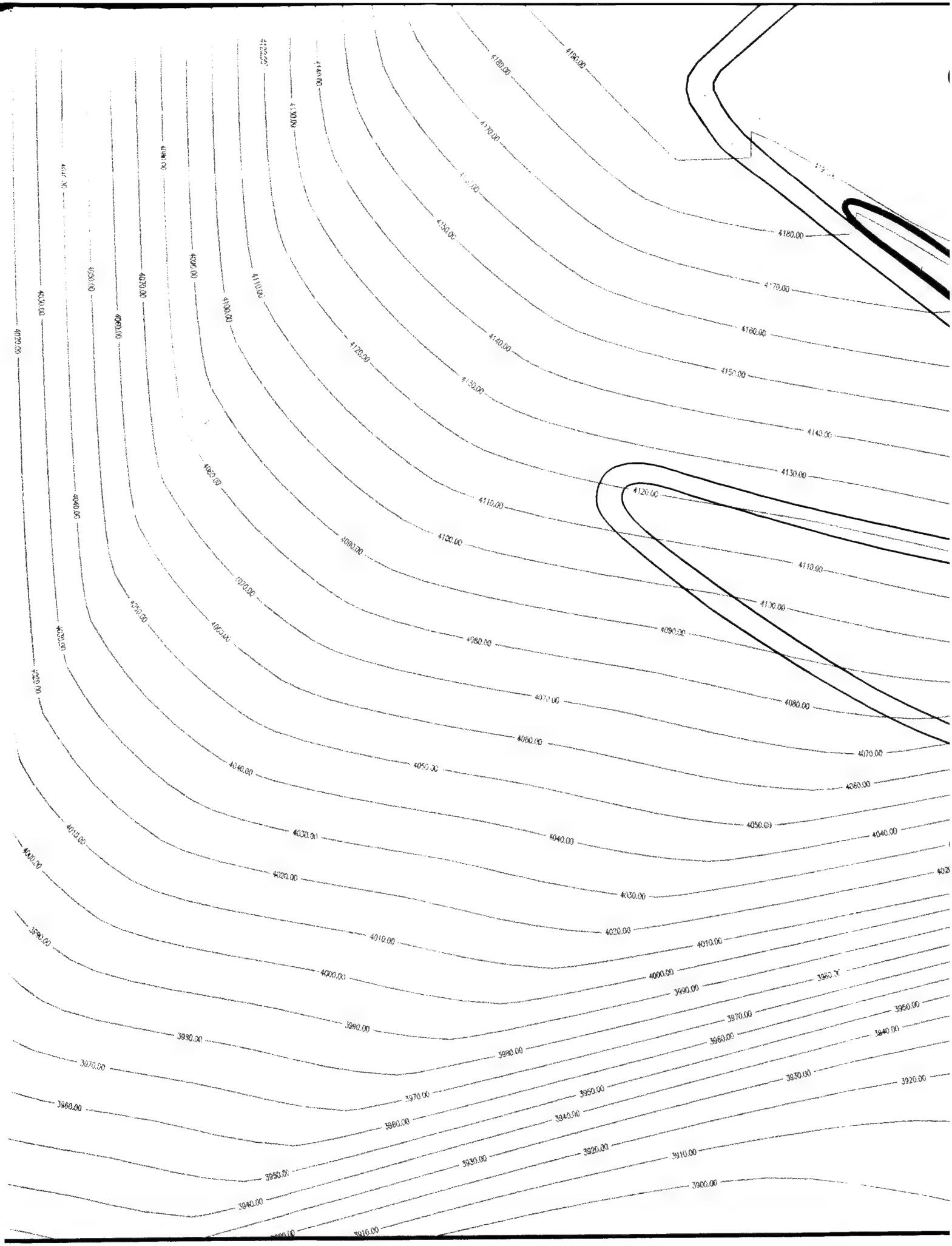
3810.00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4170.00
4160.00
4150.00
4140.00
4130.00
4120.00
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4100.00
4090.00
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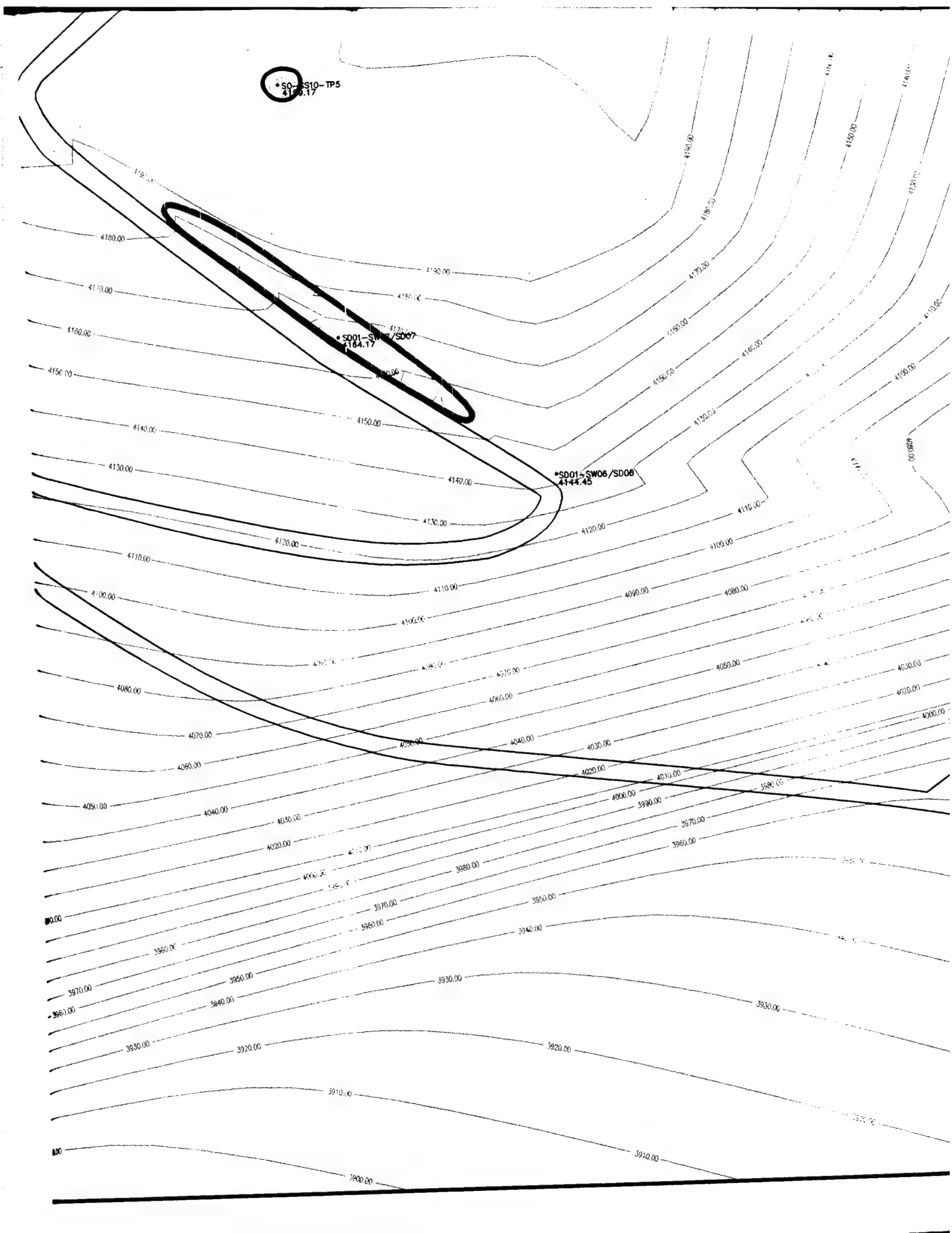
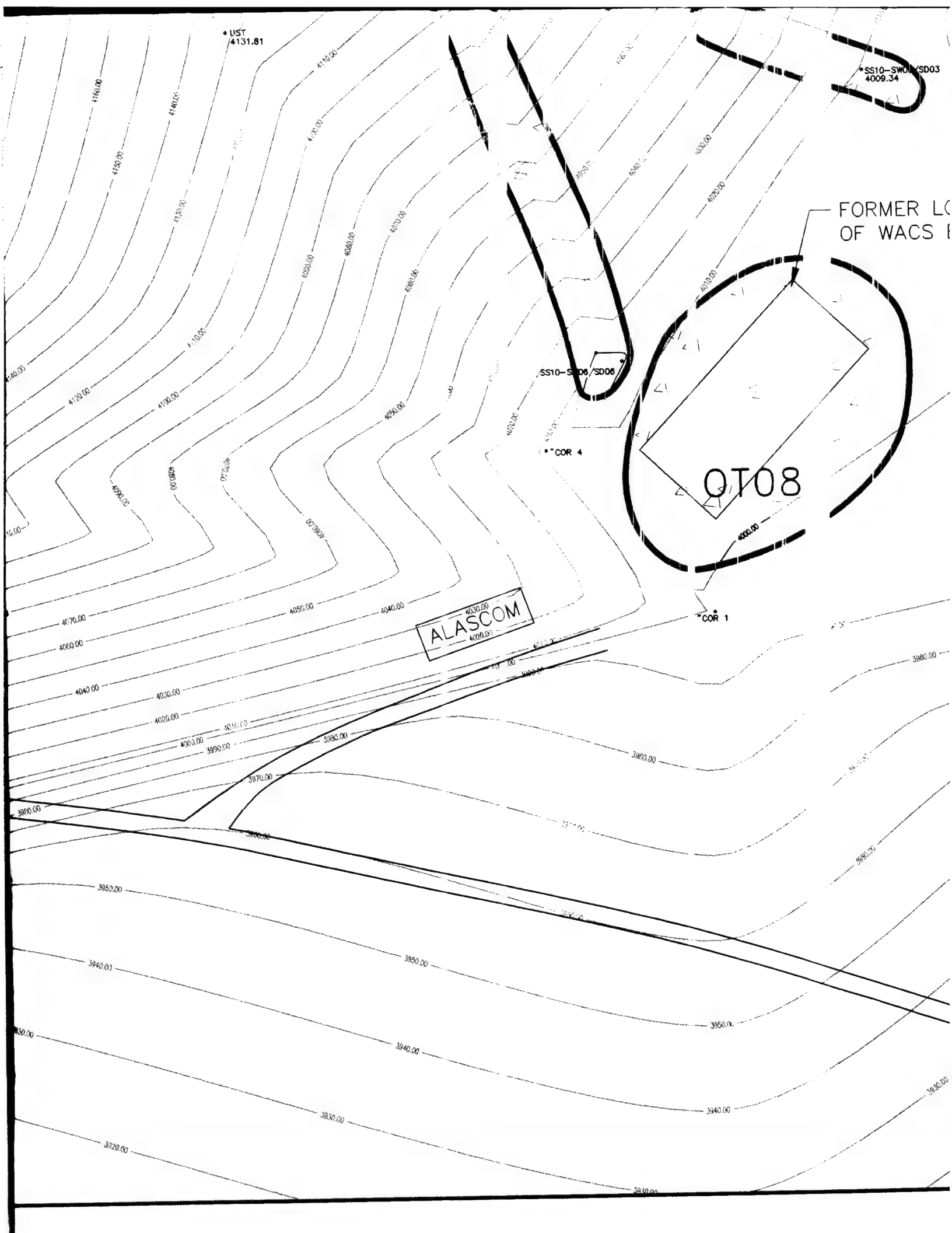
3900.00


SD01–SW07/SD07
4184.17
SD01–SW06/SD06
4144.45


UST
4131.81
SS10–SWO
SD03
4009.34
FORMER LO
OF WACS
SS10–S
SD06
SD06
COR 4
OT08
4000.00
COR 1
ALASCOM
4030.00
4020.00
4110.00
4120.00
4130.00
4140.00
4150.00
4160.00
4100.00
4090.00
4080.00
4070.00
4060.00
4050.00
4040.00
4030.00
4020.00
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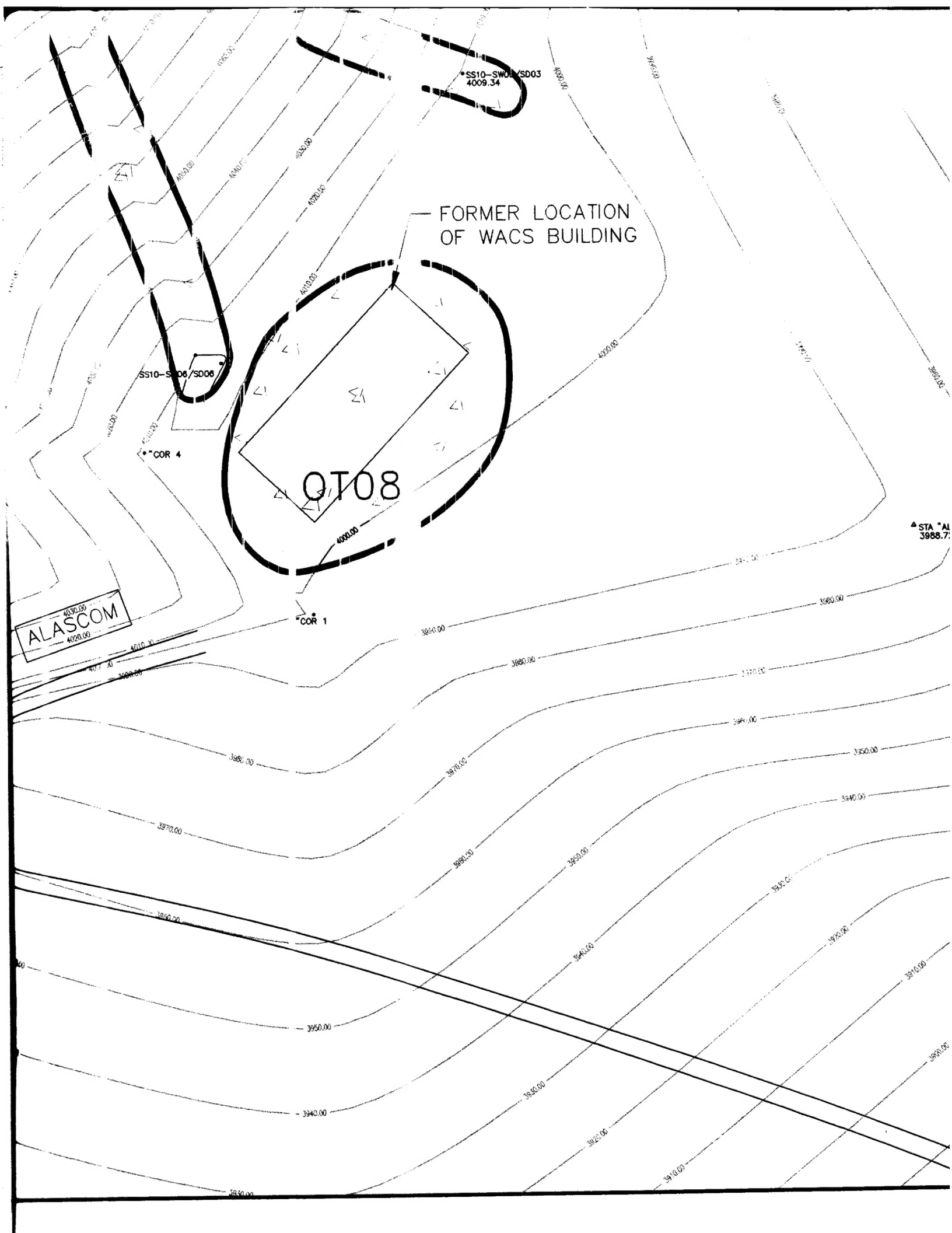
SS10–SW03/SD03
4009.34
FORMER LOCATION
OF WACS BUILDING
SS10–SW06/SD06
COR 4
QT08
4000.00
COR 1
ALASCOM
4030.00
4020.00
4010.00
4000.00
3990.00
3980.00
3970.00
3960.00
3950.00
3940.00
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3870.00
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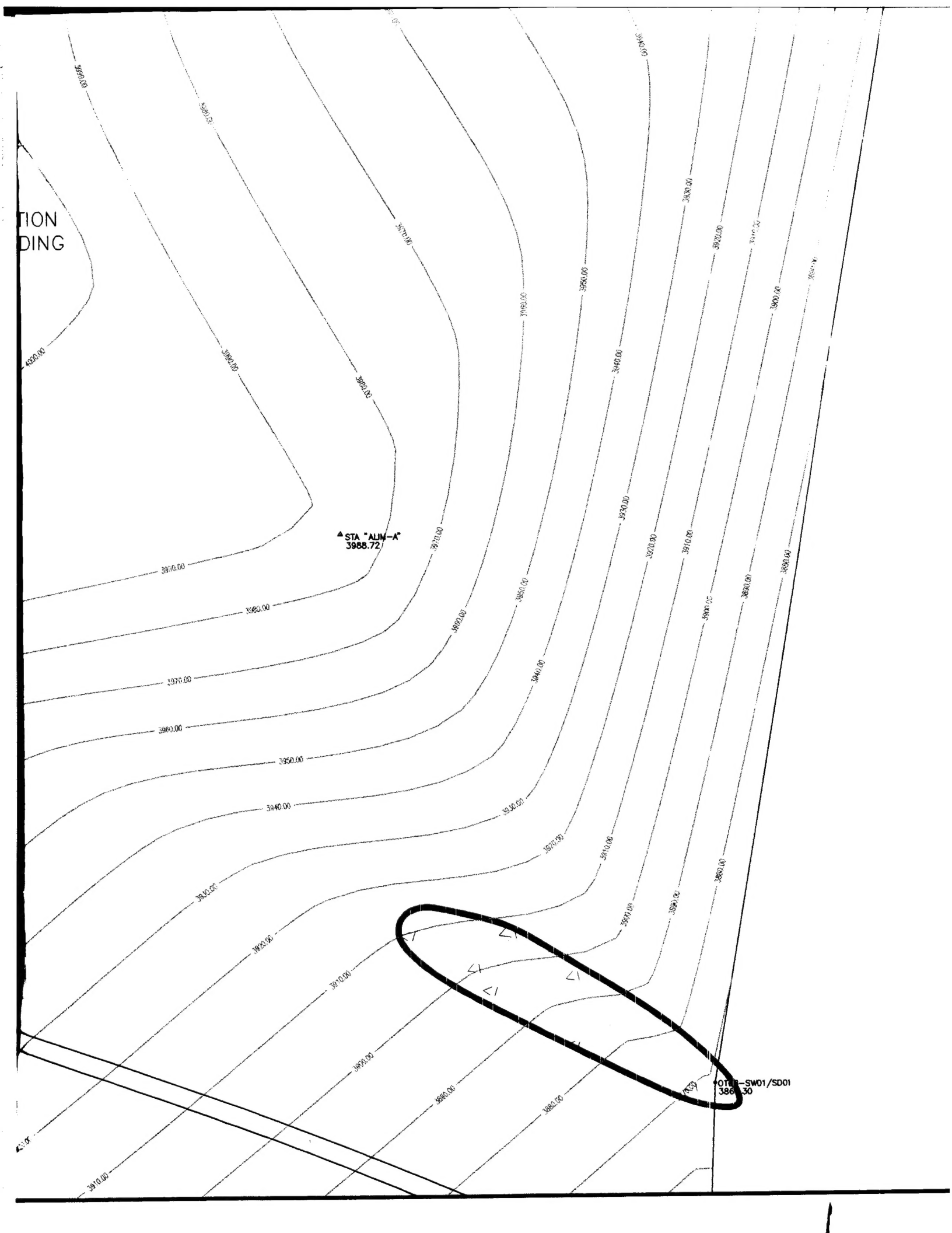
3850.00
3840.00


TION
DING
STA "ALIN-A"
3988.72
3990.00
3980.00
3970.00
3960.00
3950.00
3940.00
3930.00
3920.00
3910.00
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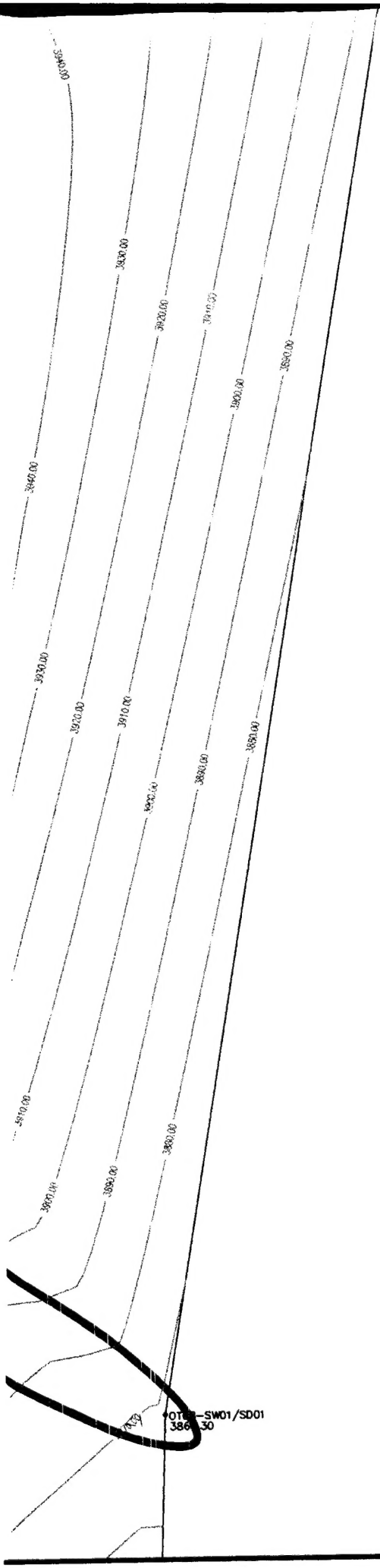
3890.00
3880.00
3870.00
3860.00
3850.00
4000.00
OTCB-SW01/SD01
386 30



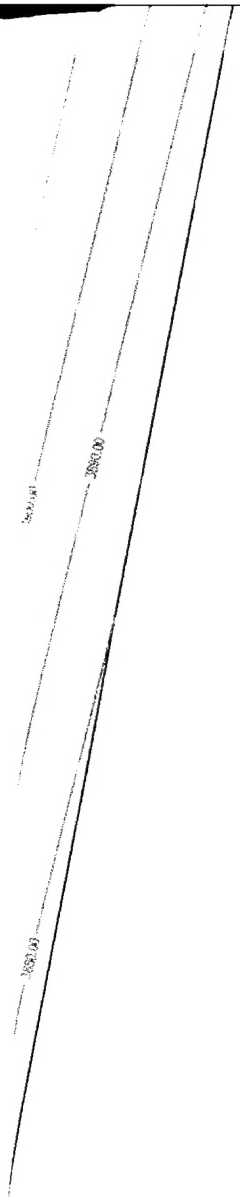
0 50 100 20

SCALE IN FEET

INDIAN MOUNTA
LONG RANGE RADAR

ENVIRONMENTAL CONDI
OF PROPERTY
UPPER CAMP

PROJ. MGR.	ACAD FILE NO.	FIGURE NO.
R.HENRY	PLATE2	PLA
DRAWN BY	PROJ. NO.	
RLB	05-G-46200	



0 50 100 200

SCALE IN FEET

INDIAN MOUNTAIN
LONG RANGE RADAR STATION

ENVIRONMENTAL CONDITION
OF PROPERTY
UPPER CAMP

PROJ. MGR. R.HENRY	ACAD FILE NO. PLATE2	FIGURE NO. PLATE 2
DRAWN BY RLB	PROJ. NO. 05-G-46200	DATE 2/13/95